## REEDS COMPUTER CODE

#### FINAL REPORT

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#### 1.0 INTRODUCTION

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The REEDS homputer code is a tool useful for the estimation of certain rocket exhaust effluent concentrations and dosages and their distributions near the earth's surface following a rocket launch event. Output from REEDS has been useful in producing near-real-time air quality and environmental assessments of the effects of certain potentially harmful effluents, namely HCL,  $Al_20_3$ , CO, and NO. REEDS is the last in an evolutionary series of codes which treats the atmosphere within the first few kilometers of the earth's surface as a single layer; thus the name REEDS - Rocket Exhaust Effluent Diffusion Single layer model.

REEDS was developed for the NASA tropospheric environmental program by the NASA/Marshall Space Flight Center (MSFC) Environmental Effects Task Team (EETT) member, Science Applications, Inc. NASA leadership was provided by the EETT leader, Dr. J. Briscoe Stephens. As a result of continuing research, the function of REEDS is being largely replaced by the more comprehensive multi-layer diffusion program, REEDM. Therefore, this document should valuably assist the process of evaluating the progress made by the application of new techniques to the assessment problem.

REEDS is designed to operate on a Hewlett Packard 1000 series computer system. Research, development and testing took place on the MSFC system at the Space Sciences Laboratory (SSL), followed by implementation and subsequent operational monitoring support and bio-medical studies via the system at the Kennedy Space Center (KSC). A modest effort was made to keep these systems compatible for modeling software operations purposes, even though their diverse purposes obviously gave the systems different capabilities, peripheral hardware, and software.

An important feature of the HP1000 series computers used in the REEDS code is the Program Scheduling feature. The feature permits one self-contained program to initiate another completely self-contained program, and then return operation to the first. This is somewhat analogous to the FORTRAN feature of calling SUBROUTINES. Thus, a program which completely fills the available



program memory may execute another, which may execute another, etc., greatly expanding the capabilities of the computer system. Thus, the main executive module schedules major modeling modules, which, in the schedule other modules, facilitating a logical division of research and mode of effort. The resulting overall structure in the REEDS application is illustrated in Figure 1-1.

REEDS was originally developed for interactive graphical operation through an SAI Plasmascope  $^{TM}$ \*. The requirement for compatibility with the KSC installation necessitated the development of a graphics handler permitting operation with or without the Plasmascope  $^{TM}$ . This handler uses several assembly-level programmed subroutines, which constitute the only non-FORTRAN software in the package, and which permit complete operation via the HP Cathode Ray Tube (CRT) terminals as well as the Plasmascope  $^{TM}$ .

While the REEDS code is set up primarily for operation on Titan, Delta, and Space Shuttle Vehicles at their respective KSC/Cape Canaveral Air Force Station (CCAFS) sites, it has a capability for far more general applications. The vehicle data, primarily source rate and altitude histories, are input in parametric form. Simple replacement of these and the site coordinates allows the user to apply the code to a far more general class of problems. This is especially true since the code can handle both the continuous and instantaneous sources.

Further documentation regarding structure and modeling will be found in Section 2 of this document. Operational guidance is contained in Section 3, and program and input data file listings will be found in Section 4.



<sup>\*</sup>Trademark of an SAI Technology Division Product.

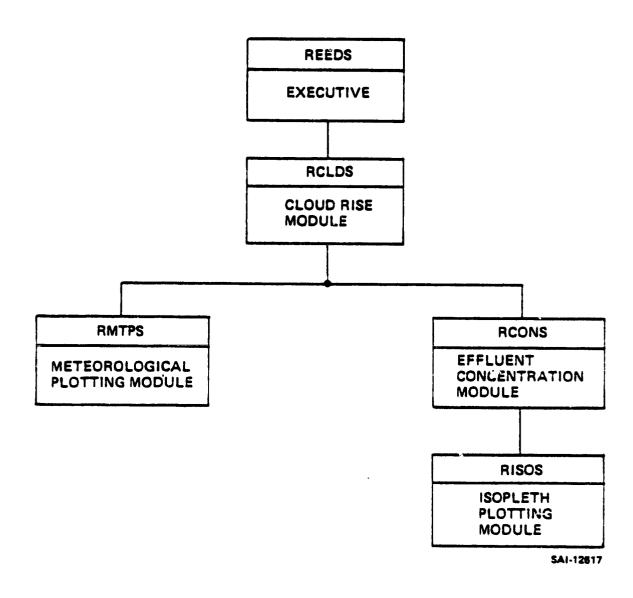


FIGURE 1-1. REEDS PROGRAM SEGMENT SCHEDULING HIERARCHY

#### SECTION 2.0

#### REEDS MODEL DESCRIPTION AND BASIC STRUCTURE

The overall structure of the REEDS code is broken down into blocks which largely mirror the phenomenological categorization of the effluent diffusion processes. There is first a "Thermodynamic Phase" in which a rocket exhaust cloud is generated, transported and expanded until approximate thermodynamic equilibrium with its environment is reached (Figure 2-1). RCLDS module (cloud rise module) contains most of the modeling for this phase. RCLDS calls RMTPS, which illustrates the local meteorology on a plotter for the user, showing approximate geometric relationships with respect to the effective atmospheric boundary layer interface. Then, thermal equilibrium having been reached, the turbulent diffusion process is allowed to proceed (Figure 2-2) in the "Kinetic Phase". The RCONS module contains most of the modeling for this process, and plots the concentration and dosage as a function of range along the cloud centerline. RCONS also calls RISOS, which plcts concentration and dosage contours (called "ISOPLETHS") on a map of the launch vicinity. Of course, control, meteorological, and configuration input is provided by the main REEDS executive module, as is sequence control.

To make input more flexible, use is made of "question" input files. For each module for which it is necessary, user input prompts are stored in an indexed file, from which a module may draw in order to prompt the user for a particular input. Changes and/or additions may then be made as necessary to these files. Listings of these files are shown in Section 4.

The structured diagram of Figure 2-3 illustrates the gross operational sequence of the entire code. This will be elaborated upon in the following subsections.

#### 2.1 MODULE DESCRIPTION

Each module will now be roughly described in narrative fashion, seasoned with the appropriate mathematical expressions employed in the modules. As much as possible, the narrative "walk" through each module will follow the commenting in the code. Some commenting not directly related to calculational procedures may be excluded from the description. In addition to making use of



**TOP VIEW** 

**EXHAUST CLOUD GROUND TRACK** 

2-2

LIBORT 1. IT STEATION OF THE WINEFRANDYKING WILLIAMS TO SELFT IN RETURN

RISE

GENERATION

CLOUD

FIGURE 2.2. 3LLUSTRATION OFTHE "KINETIC" PHASE MODELED IN REEDS

SAI.1320

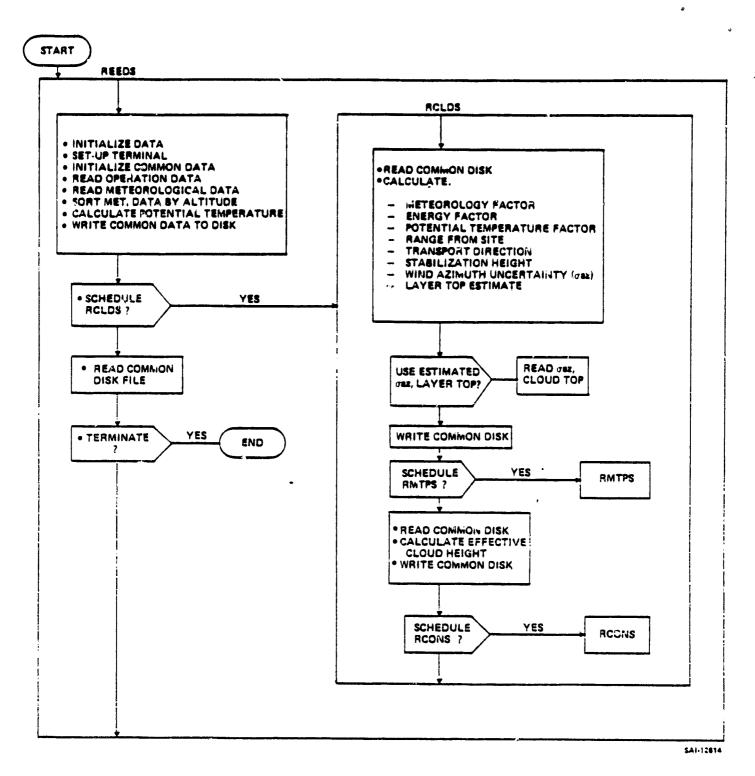


FIGURE 2-3. STRUCTURED DIAGRAM OF THE REEDS CODE SHOWING IMPORTANT AND COMMENTED OPERATIONS

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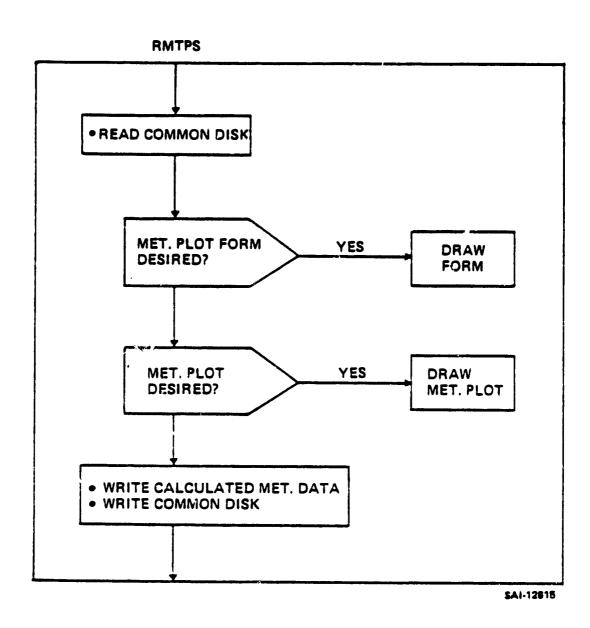


FIGURE 2-3. (Continued) STRUCTURED DIAGRAM OF REEDS CODE

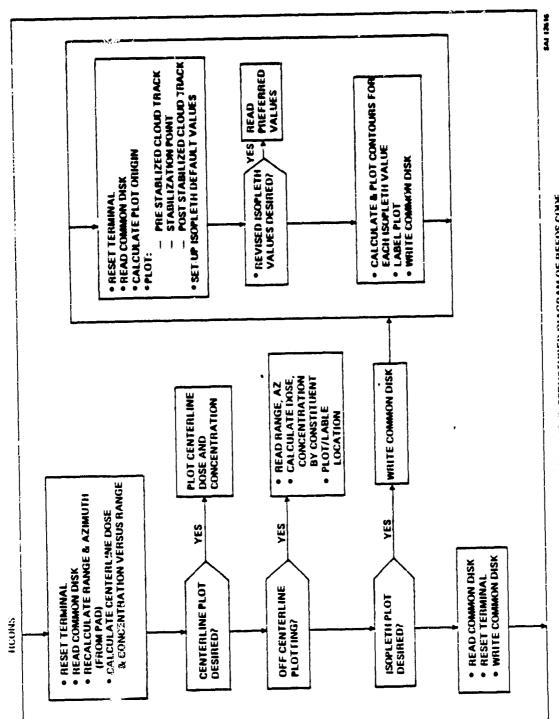


FIGURE 2.3. (Concluded) STRUCTURED DIAGRAM OF REEDS CONE

the commenting in the code as "landmarks", use will be made of the structured diagram of Figure 2-3 for guidance in module description. Each major calculational and structural event or user input option will be noted as a paragraph heading throughout these descriptions.

The REEDS code makes use of bulk or "blank" common to simplify the use of subroutines. A penalty was paid for this in the form of a slight loss of modularity and some pain and agony due to vulnerability to "side effects" (indirectly and inadvertently changing a variable modification/upgrade). The penalty was lessened by structuring the common into testable "pseudo" blocks (not to be confused with block or labeled common), and by the use of descriptive comments for each significant "pseudo" block. This data is shared by the module and some of its subroutines, and is written to a "common" disk file. The common disk file is created by the program with the name "=REEDS" when the first attempt is made to write the common data. It is finally destroyed (purged) by the program upon successful termination of the program. If an abnormal termination leaves the file unpurged, it is, in principle, written over when it is detected to pre-exist; however, some strange results have occasionally been produced when the file pre-existed, prompting prudent users to be sure that it was purged before execution. Thus, following a brief statement of purpose, a date for last modification and any necessary loading instructions, a large block of common data (316 words) appears in each module. another module is called this data is written on the disk file. Then, as soon as the new module is in core, the disk file is read, reloading the common. When the new module concludes, or prepares to call still another module, the common data is written again. A brief description of the common variables (Figure 2-4) appears in Table 2-1.

The REEDS "Question" Files. Several REEDS modules have their own question files, within which are stored informative messages and/or user prompts. These are indexed sequential coded (and therefore listable) files, program access to which is accomplished by calling subroutine "DREAD" (for  $\underline{D}$ isk READ. The arguments to DREAD are:

1) A six (6) character, three-word file name



```
CONNON STBALT, STBHT, STBAZD, STBRNG, STBTIM, CLDRAD, RISTIM(30), BOTLAY,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SIGNO, SIGN, SIGZO, SIGAP, NDIST, YDIST, EXPZ, SOSIGZ, SIGY, SIGAL,
                                                                                                                                                                                                                                        COMMON ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30),
                                                                                                                                                          COMMON YPOS, YES, ISHD: O, IVHICL, IRUN, ICALC, IPLACE, ITINEZ, IGOTHP,
                                                                                                                                                                           NUNRUN, LU, NUN, NONLY MFORM, LUPRNT, ITDU, IPLI, IPL2, YPL3
                                                              COMMON PI, PIOVRZ, PI43, TWOPI, SGRZPI, DEGRAD, RADDEG, 1V2
                                                                                                                                                                                                                                                                                                                                                                                                                           COMMON LTIME, LTIM, LDAY, LMONTH(2), LYEAR, LAUNTD(10)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, IPTZ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COEFFICIENTS
                                                                                                              COMNON VPAR(18), STGHCL
                                                                                               VEHICLE PARAMETERS
                                                                                                                                                                                                                                                        SURDEN, FILE(3)
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                                                                                                                                             OPTION PARAMETERS
                                                                                                                                                                                                                                                                                                        CALCULATION TIME
                                               MATH PARANETERS
                                                                                                                                                                                                                                                                                                                                                           SOUNDING TIME
CONNON AREAS
                                                                                                                                                                                                                                                                                                                                                                                                             LAUNCH TIME
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Program Excerpt Showing the Common Data Arranged in "Pseudo" Blocks Figure 2-4.

TABLE 2 - 1 COMMON DATA DESCRIPTION

"PSEUDO" COMMON BLOCK	PROGRAM LABEL/ EQUIVALENCE NAME	SYMBOL	DESCRIPTION
MATH	PI	•	3.141503
PARAMETERS	PIOVRZ	<b>≠/2</b>	,5 • ₹
	P143	4 ×	1. <b>33333 •</b> #
	TWOPI	2π	2.0 • π
	SQR2PI	27	V TWOPT
	DEGRAD	π/1 <b>80</b>	DEGREES-TO-RADIANS CONVERSION PARAMETER
	RADDES	180/#	RADIANS-TO-DEGREES CONVERSION PARAMETER
	IV2	-	CONVENIENT INDEX
VEHICLE PARAMETERS	VPAR(1)/QC1	ác <sub>1</sub>	TOTAL SOURCE OUTPUT RATE (g/sec), NORMAL BURN
	VPAR(2)/QC2	Ġc₂	TOTAL SOURCE OUTPUT RATE (g/mg), ABIJORMAL- SINGLE ENGINE BURN
	VPAR(3)/QC3	ċc₃	TOTAL SOURCE OUTPUT RATE (g/mm), ABNORMAL- EXPLOSION/BURN
	VPAR(4)/QT1	ac1	TOTAL SOURCE STRENGTH (g), NORMAL
	VPAR(5)/QT2	oc2	TOTAL SOURCE STRENGTH (g), ABNORMAL- SINGLE ENGINE
	VPAR(6)/QT3	oc³ .	TOTAL SOURCE STRENGTH (g), ABNORMAL- EXPLOSION
	VPAR(7)/AA	3	1st ROCKET RISE POWER LAW COEFFICIENT
	VPAR(\$)/88	ь	*2nd ROCKET RISE POWER LAW COEFFICIENT
	VPAR(9)/CC	C	*3rd ROCKET RISE POWER LAW COEFFICIENT
	VPAR(10)/HEATN	a <sub>11</sub>	EFFECT HEAT RELEASE (cal/g), NORMAL BURN
	VPAR(11)/HEATM	a <sub>12</sub>	EFFECTIVE HEAT RELEASE (cm/g), ABNORMAL- SINGLE ENGINE BURN
	VPAR(12)/HEATA	a <sub>13</sub>	EFFECTIVE HEAT RELEASE (col/g), ABNORMAL- EXPLOSION
	VPAR(13)/PHCL	<sup>†</sup> HCL	PARTIAL FRACTION OF HCL
	VPAR(14)/PCO	fco	PARTIAL FRACTION OF CO
	VPAR(15)/PCO2	¹co <sub>2"</sub>	PARTIAL FRACTION OF CO2
	VPAR(16)/PAL205	<sup>1</sup> Al <sub>2</sub> O <sub>3</sub>	PARTIAL FRACTION OF AIZO3
	VPAR(17)/PNO	†NO	PARTIAL FRACTION OF NO
	VPAR(18)/GAMMAX	7	CLOUD RISE ENTRAINMENT COEFFICIENT
	SIGHCL	o <b>HCL</b>	CONCENTRATION STANDARD DEVIATION OF HCL



TABLE 2-1. Continued

PSEUDO COMMON BLOCK	PROGRAM LEVEL EQUIVALENCE NAME	SYMBOL	DESCRIPTION
OPTION	YPOS		CURRENT TERMINAL DISPLAY CURSOR ORDINATE
PARAMETERS	YES		LOGICAL "YES" CODE (= 1 HY)
	ISNDFO		METEOROLOGICAL DATA TYPE INDICATOR
			0 = SOUNDING 1 = FORECAST
	IVHICL		ROCKET VEHICLE INDEX
			(1, 2, 3, 4, 5 FOR SPACE SHUTTLE, TITAN, DELTA, DELTA 3914, AND MINUTEMAN, RESPECTIVELY)
	IRUN		PROGRAM EXECUTION MODE (OPERATIONAL PRODUCTION)
	ICALC		CALCULATION FLAG
	IPLACE		METEOROLOGICAL DATA LOCATION CODE
	- ITIMEZ		METEOROLOGICAL DATA TIME ZONE CODE
	IGOTMP	-	FLAG TO INDICATE WHETHER OR NOT A WAP ORIGIN HAS BEEN SET
	NURMUN		TOTAL NUMBER OF RUNS (MET DATA FILE TO PROCESS)
	LU		INTERACTIVE TERMINAL DEVICE CODE
,	NUM		RUN SEQUENCE NUMBÉR
	MONLY		METEOROLOGICAL PLOT SWITCH
			1 - YES 0 - NO
			USED IF ONLY PURPOSE OF RUN IS MET PLOTS
	MFORM	·	METEOROLOGICAL PLOT FORM SWITCH
			1 = YES 0 = NO
	LUPRNT		PRINTING LOGICAL DEVICE KEY
		,	6 - PRINTER OUTPUT, ELSE NO PRINTER OUTPUT
	ITOU		TOWER DATA SWITCH
			0 = NO TOWER DATA 1 = TOWER DATA
	IPL1		METEOROLOGICAL PLOTTING DEVICE CODE
	IPL2		CENTERLINE PLOTTING DEVICE CODE
	IPL3		ISOPLETH PLOTTING DEVICE CODE



TABLE 2-1. Continued

PSEUDO COMMON BLOCK	PROGRAM LEVEL EQUIVALENCE NAME	SYMBOL	DESCRIPTION
LAUNCH TIME	LTIME		LAUNCH TIME FLAG (TRUE IF LAUNCH TIME READ; OTHERWISE, FALSE)
	LTIM		LAUNCH TIME OF DAY (0001; 2400)
	LDAY		LAUNCH DAY OF MONTH (01; 31)
	LMONTH		2 WORD ARRAY FOR LAUNCH MONTH OF YEAR (e.g., 2HJA, 1HN)
	LYEAR		LAUNCH YEAR (e.g., 1981)
	LAUNTD		ARRAY OF CHARACTERS COMPRISING THE LAUNCH DATE AS READ FROM THE TERMINAL
CLOUD STABILIZATION	STBALT	н	STABILIZATION HEIGHT (METERS)
AND LAYER PARAMETERS	STBHT	HSE	EFFECTIVE STABILIZATION HEIGHT (METERS)
FARAME I ERS	STBAZD	0.	AZIMUTH FROM PAD OF STABILIZATION (DEGREES)
	STBRNG	Rs	RANGE FROM PAD OF STAPILIZATION (METERS)
	STBTIM	ta l	TIME FROM LAUNCH OF STABILIZATION (SECONDS)
	CLDRAD	Rc	RADIUS OF CLOUD (METERS)
	RISTIM'	∆t <sub>i</sub>	30-WORD ARRAY OF TIMES FOR PASSAGE OF CLOUDS THROUGH EACH MET. LAYER
	BOTLAY	z <sub>B</sub>	HEIGHT OF BOTTOM OF LAYER CONTAINING STABILIZATION ALTITUDE
	TPLAY	z <sub>T</sub>	TOP OF LAYER CONTAINING STABILIZATION
	CALHT	z	CALCULATION HEIGHT $\{z_B \times z \leq z_T\}$
	LAYTOP		INDEX OF LAYER TOP ARRAY ELEMENT CONTAINING STABLIZATION
	LAYBOT		INDEX OF LAYER BOTTOM ARRAY ELEMENT CONTAINING STABILIZATION
	REFLEC	γ	SURFACE REFLECTION COEFFICIENT
			0 = TOTAL REFLECTION 1 = TOTAL ABSORPTION
	IPTZ	AUD- AUD	LEAST SQUARE FIT FLAG FOR POTENTIAL TEMPERATURE GRADIENT CALCULATION
•			1 = NO FIT 9 = USE THE FIT



TABLE 2-1. Continued

PSEUDO COMMON BLOCK	PROGRAM LEVEL EQUIVALENCE NAME	SYMBOL	DESCRIPTION
MET DATA	ALT	Z	ARRAY OF LAYER-TOP ALTITUDES IN THE MET PROFILE
	IDIR	ð	ARRAY OF WIND DIRECTIONS OF THE LAYERS OF THE MÉT PROFILE
	SPEED	u	ARRAY OF WIND SPEEDS OF THE LAYERS OF THE MET PROFILE
•	TEMP	T	ARRAY OF TEMPERATURES OF THE LAYERS OF THE IMET PROFILE
	PRESS	P	ARRAY OF PRESSURES OF THE LAYERS OF THE MET PROFILE
	PTEMP	PT	ARRAY OF POTENTIAL TEMPERATURES OF THE LAYERS OF THE MET PROFILE
	SURDEN	αo	SURFACE DENSITY OF THE MET PROFILE
	FILE		FILE NAME ARRAY (6 CHARACTERS, 3 WORDS) OF THE MET.
CALCULATION	ITIME		CALCULATION TIM(( OF DAY (0001; 2400)
TIME	IDAY		CALCULATION DAY OF MONTH (01:31)
i	IMONTH		2-WORD ARRAY FOR CALCULATION MONTH OF YEAR (e.g., 1981)
SOUNDING	ISTIME		SOUNDING TIME OF DAY
TIME	ISDAY	شقيون	SOUNDING DAY OF MONTH (01:31)
	ISMONTH		2-WORD ARRAY FOR SOUNDING MONTH OF YEAR (e.g., 2HFE, 1 HB)
	ISYEAR		SOUNDING YEAR (e.g., 1981)



TABLE 2-1. Continue #

PSEUDO COMMON BLOCK	PROGRAM LEVEL EQUIVALENCE NAME	SYMBOL	DESCRIPTION
DIFFUSION	SIGXO	σ×ο,	STABILIZED CLOUD ALONG WIND STANDARD DEVIATION
COEFFICIENTS	SIGX	υX	ALONG-AXIS 1-CLOUD EXTENT
	SIGAP	σ <sub>A</sub> '	WIND AZIMUTH STANDARD DEVIATION AT STABILIZATION
	XDIST	X	ALONG-AXIS DISTANCE
	YDIST	Υ	OFF-AXIS DISTANCE
	EXPZ	ΣZ	VERTICAL DOSAGE TERM
	SOSIGZ	20Z <sup>2</sup>	TWICE THE SQUARE OF THE 1- VERTICAL CLOUD EXTENT
	SISY	ργ	OFF-AXIS 1-CLOUD EXTENT
	SIGAL	PAL	LAYERED-AVERAGED WIND AZIMUTH STANDARD DEVIATION
	CLDLNG	c <sub>L</sub>	CLOUD LENGTH (MITTERS)
	AVSPD	U	SPEED OF CLOUD AVERAGED OVER MET. LAYERS (METERS) SEC)
	AVDIR	ь	DIRECTION OF CLOUD AVERAGED OVER MET LAYERS (DEGREES)
	SIGAZ	<sup>U</sup> AZ	WIND AZIMUTH UNCERTAINTY (DEGREES)
CONCENTRATION	CONMAX	\M	MAXIMUM PEAK CONCENTRATION (PPM)
AND DOSAGE VALUES AND RÁNGES	CONCPK	\\p	PEAK CONCENTRATION (PPM)
	DOSMA.X	D <sub>M</sub>	MAXIMUM PEAK DOSAGE (PPM-SEC)
	DUSPK	Op	PEAK DOSAGE (PPM-SEC)
	RNGSMC	R	RANGE OF MAXIMUM CONCENTRATION (FROM PAD)
	RNGSMD	RMD	RANGE OF MAXIMUM DOSAGE (FROM PAD)

8AI-12790



- 2) The desired line number (index + 1)
- 3) A sixty-four (64) character (32 word) data buffer to receive the ASCII data.

The first line of each question file is an eighty (80) character sequence of the numbers

#### 1234567890123456789012. . .

useful for preparation/editing of the question file itself (i.e., aids in columniation of characters), so the actual line number is always one (1) greater than the index of useful data to be retrieved from the question file. Section 4.3 shows the REEDS question file listing. Special CRT display enhancement characters are often embedded as part of the character strings. They are unprintable with the selected print option used in generating the listings of Section 4, and do not show up even as blank spaces. This gives an erroneous column indication for characters which do show up. However, the special Character Display feature of all HP CRT's permits display of the enhancement character symbols, facilitating editing of the lines of these files. Once read by DREAD, these lines are printed on the desired device by subroutine "CHAR", which performs the necessary terminal-dependent oerations required to display the line read.

Communication of Data To (Or From) Output Files. When it is desirable to communicate program numeric data to (encoding) an output file, or from (decoding) that file, it must be first internally converted to (or from) an ASCII character string. Encoding is accomplished with a call to the system subroutine "CODE" and a subsequent specialized "READ" operation. Decoding requires the use of "WRITE", instead of "READ". The optional argument to CODE is the number of characters desired to be encoded (or decoded). Many painful agonies were avoided by explicitly defining and using this argument. Also great debugging horrors were generated by inadvertently putting some other statement between the call to "CODE" and its subsequent "READ" (or "WRITE"), or otherwise failing to resolve a call to "CODE" with the necessary "READ" (or "WRITE") call. (These are mentioned here in the event users use this document as a reference in making any changes to REEDS.) The arguments to "READ" (or "WRITE") are normally the standard output device variable and the FORMAT code. However, when "READ"



(or "WRITE") is used to resolve a call to "CODE" to encode (non-ASCII) or decode (ASCII) data, the first argument is the array variable name used to receive the encoded (or send the decoded) data. The size of this array must be compatible with the FORMAT statement (the 2nd argument) used to accomplish the "READ" (or "WRITE"). Once encoded, the ASCII string is written to an output, whenever it is desired, in the normal fashion, i.e., with an "A" FORMAT formatted "WRITE" call. If the data were decoded (via the "WRITE" call) instead, the resulting data (FORMAT permitting) could be arithmetically or otherwise processed, and must be re-encoded if the ASCII string is needed.

### 2.1.1 The REEDS Executive Module

The REEDS executive module

- Initializes some global operational, terminal control, and calculational data
- Reads additional control and parameteric data
- . Reads and prepares the meteorological data
- Calculates the potential temperature profile
- Controls subsequent scheduling of modules.

The bulk of the module consists of interactive option selection and related parameter initialization. The main program (file "REEDS") is 1157 source lines long at this printing, and the subroutine packages required (files "REEDT", "LINE", "DLINE", "CALIX" and "CTLB2") constitute another 1555 source code lines. Refer to Figure 2-3 as necessary to follow the program structure.

User Terminal Identification Setup. The type of terminal (CRT, Plasmascope) is first discerned by the program from system tables internal to the HP1000 operating system. Some terminal parameters are subsequently initialized -- automatically and transparent to the user. The header is transferred from the REEDS executive module question file (called "=REEDS") to the terminal display.

Cloud Rise Fit or Virtual Potential Temperature Lapse Rate Fit Option. The desired fit to the Lapse Rate of Virtual Potential Temperature is then produced for the cloud rise model as a result of a user option. The choice is between a deterministic method or a least squares method suggested by



EETT leader Dr. J. B. Stephens. The latter method produces consistently lower altitudes than the former for cloud rise stabilization and has thus been termed the "low altitude fit". This choice remains as a user option pending documented validation of one method or the other. This option was installed after Plasmascope operation was largely phased out. Thus, the normal terminal independent input sequence is not used, rather, a direct CRT terminal input is used.

program was designed to process multiple meteorological data files if that is desired. The procedure is to set up a series of data files which have in common the first four (4) characters of their names, and a relative sequence number, i.e., 01, 02, . . . 99, for their last 2 characters. When prompted to do so, the user enters:

XX. FFFFYY

for the number of runs, data file name root, and code YY, respectively, where

XX = Number of runs desired [01; 99]

FFFF = The first four (4) characters of the series of meteorological data file names

YY \* The file of the series it is desired to start with, e.g., DATAO1

The program has a default data file name root of "DATA" which may be invoked by either assenting to the use of the default (which also assumes there will be only 1 run of DATAO1), or by entering blanks for FFFF ( which causes any entry for YY to be ignored, presetting its value to 1, thus causing the series DATAO1 DATAXX to be executed). One run of an arbitrary file name is accomplished by declining the default, and entering

XX. FFFFYY



where XX = 01, and FFFFYY is the six (6) character file name desired, e.g.,

O1. TESTFZ

Geographical Location and Time Zone Codes. As a result of a standard NASA naming convention the geographical location, and therefore the time zone code, can be embedded within the meteorological data file name. These are the common variable ITIMEZ and IPLACE, respectively. The following illustrates the implications of certain non-standard values for FFFF:

FFFF = VAND (Vandenberg AFB), IPLACE = 1, ITIMEZ = 1HP

FFFF = KSC (1965 data tape), IPLACE = 2, ITIMEZ = 1HE

FFFF = KSC, IPLACE = 3, ITIMEZ = 1HE

FFFF = SPEC, Special location, IPLACE and ITIMEZ = 0, and actual subsequently input according to the format: values

:XX,YYZ,AAAA

where

Ĭ,

XX = Day of month [01; 31]
YYY = Month [Jan; Dec], and
AAAA = Time [0001; 2400].

Any other input is assumed to be the standard KSC meteorological data file with ITIMEZ = 1HE, and IPLACE = 2. The meteorological data file can only be an actual sounding for FFFF = SPEC, whereas for other inputs sounding and/or TOWER data may be used.

Research, Operational, or Production Modes. As of the time this document was being generated the only validated mode of these alternatives was the operational mode -- which is also the default and most commonly used mode. While the additional user inputs inherent to the research mode will be mentioned, their demonstration in Section 3 will have to await a subsequent revision of this document. Nevertheless, the appropriate non-default selection is made by entering a single character R, O, or P, respectively. This results in the



setting of common variable IRUN to 1, 2, or 3, respectively. Default selection is, of course IRUN = 2.

Atmospheric Mixing Layer Top and Wind Azimuth Uncertainty - For Production Runs. For production runs, the input of the top of the atmospheric mixing layer, TOPLAY, (in meters) and the standard deviation of the wind azimuth uncertainty, SIGAZ, (in degrees) must be input from the keyboard. The format, upon prompt is

XXXX.XX

for TOPLAY, with possible range [0;999999.0] meters, followed by

XX

for SIGAZ, with possible range [0;99] degrees. For the other operational modes (Research, Operational) the values of TOPLAY and SIGAZ are estimated and then optionally changed by the user. This will be elaborated upon when it is encountered in the RCLDS cloud rise module (Section 2.1.2)

Meteorological Forms Switch. The REEDs program plots some of the meteorological data (called a "Met Plot") and a schematic of the stabilized exhaust cloud. The form for this plot can also be prepared by the program on the plotter, but the process is very time consuming. Therefore, it is better done as infrequently as is necessary and high-speed reproduction devices used to generate a supply of the forms. For the purpose of generating this form, the REEDS program may be run to the point of this input for the sole purpose of generating the form. The run may then be terminated and subsequently restarted once a supply of forms is available. Thus, when prompted for "Met Plot Forms?", the user may respond "Y" for 'Yes' or "N" for 'No', the latter of which is the default response. This sets the common (OPTION pseudo block) parameter MFORM to 1 or 0, respectively.

Meteorological Plots. The meteorological plot may also be skipped if it is desirable. When prompted, a "Y" or "N" indicates 'Yes' or 'No', respectively. This sets the common OPTION pseudo-block) parameter MONLY to 1 or 0, respectively. The first setting is the default setting.



Line Printer Output. The line printer output may be omitted if desired. When prompted a "Y" or "N" indicates 'Yes' or 'No', respectively. This sets the common (OPTION pseudo-block) parameter to 6 or  $64_{10}$  respectively. The first setting is the default setting, and its value of 6 indicates the standard printing device code. The value of  $64_{10}$  for the alternate setting formerly cleared the parameter (largest value was  $77_8 = 63_{10}$ ). Now, however, the device code range has been extended above  $100_8$ , making  $64_{10}$  a legal device code. However, no such code is active on the MSFC or KSC machines, so no change (e.g.,  $64_{10} \rightarrow 128_{10}$ ) has yet been made.

Launch Time and Date. The current computer system time and date are loaded into the launch time and date variables, LTIM, SDT, LDAY, LMONTH, LYEAR via the call to the subroutine GETDT, which reads the system clock. The user is prompted for this information, and if the response to the prompt is "N" for 'No', the system time/date is rejected as the launch time, and opportunity is given for the above variables to be read accordingly to

### TTTbbbbbbDDbMMMbYYYY

where TTTT = the time of day [0001;2400],

b or bbbbb = blank space place holders indicating the number of userinput blank spaces

DD = the day of the month [01;31]

MMM = the month [JAN; DEC]

YYYY = the year (e.g., 1980)

If the response to the original prompt is "Y" for Yes or blank, the system time is accepted for the default launch time/date, and the time/date variables are left as initialized.

Launch Vehicle. The user is then prompted for the launch vehicle desired. The options are "D" for Delta, "T" for Titan, and "S" for Shuttle. This sets the common (OPTION pseudo-block) variable IVHICL to 0, 1, or 2, respectively.

Meteorological Data Input. If the IPLACE parameter, set by the meteorological data file name read above, is 2, then the forecast/sounding data

is assumed to reside on tape and is read from device code 8 via subroutine KSC65 (explained below). Otherwise the appropriate disk file name is opened. Whether the data represents an actual sounding or a forecast is indicated by a code read from the file header. If a sounding is indicated, the data type parameter, ISNDFO, (an OPTION pseudo-block common variable) is set to 0; if it is a forecast, it is set to 1. As the header and/or data lines are read, they are printed on the printer device. The following indicates the sequence or data lines read.

- (1) test code, data type and location header information
- (2) time of data, ascent and data header information
- altitude (feet)
  wind direction (degrees from north)
  wind speed (knots),
  temperature (°C),
  Dew Point (°C),
  pressure (millibars)
  relative humidity (percent)
  Absolute humidity (gms/M³) (if present on file)
  Air density (gms/M³) (if present on file)
- (4) Terminator (NNNN) indicating end of data. (See Section 4.4)

The program is designed to ignore all non-essential data words and/or data lines. The altitude and wind velocity are then converted to other units; they are converted as follows:

other data (if present) (ignored by program)

altitude → m
wind speed → m/sec

All data lines with altitudes less than 10000 feet are then sorted by ascending order of altitude. The potential temperature is then calculated according to



PTEMP; = 
$$(TEMP_1 + 273.6) \left(\frac{1000}{PRES}\right)^{.288}$$

where PTEMP, TEMP, and PRESS are the COMMON variables (MET data pseudo-block) potential temperature, temperature, and pressure, respectively. The sorted data is then written on the output device and the meteorological data file closed.

MET file Reads Via Subroutine KSC65. The subroutine KSC65 handles MET file reads from tape (device code 8). The sequence of data is identical to that of the disk file read. The subroutine was designed to read large data bases, especially the 1965 KSC meteorological data tapes (thus the subroutine name). The arguments to KSC65 facilitate selection of specific data sets from the tape. They are as follows:

IBUF = Eighty (80) character (40 word) integer buffer array to hold ASCII data lines read from device 8 pending decoding.

DPTEMP = dew point temperature array to be passed back to the main program

ITIMG = Sounding time desired

IDAYG = Sounding day desired

IMONG = Sounding month desired

ISNDG = data type desired (sounding/forecast)

RUNNUM = run numbers desired

Creation of the Common Data Disk File. The common data, though not completely defined yet, is written to the disk file "=REEDS" via a call to the subroutine "RWDIS." The two arguments to RWDIS are the six (6) character common data disk file name (3 integer words, 2 characters each), and the operation integer code (1 = write).

RWDIS contains the 316 word common block as it exists in the main program. In addition, space is provided for the data control block array (locally called ODCB) necessary to control the disk read (transparent to user - only provision of the space necessary, i.e., 144 integer words or more for the control array). The data is transferred to/from disk via a buffer array. While the common data transferred is 316 words, disk storage is only by integer word equivalents. Thus, because of the real data variables/arrays, the integer word equivalent of the 316 words is 557 words. The buffer array is thus 557 words. The ISIZE array, which is the parameter controlling the file creation operation, must have its two integer words set to 30 and 557, respectively. The first word is the number of blocks the 557 words are written in.

The file is first opened. If it is not detected to pre-exist, the file is created with the CREAT system call. For a RWDIS operation code of 1, the file is written; if 0, the file is read. The file is then closed.

Transfer to the Cloud Rise Module. As can be seen in Figure 2-3, transfer to the Cloud Rise Module RCLDS then occurs. The transfer is accomplished via the system EXEC call, which schedules the program whose name is contained in a six (6) character (3 word) argument array (RCLDR). The program must have an ID segment in CORE, an operation accomplished via the File Manager RP command which must be executed before the running sequence begins (see File Manager or Terminal Users manual).

<u>Program Termination</u>. At the conclusion of RCLDS, transfer is returned to REEDS and the user is prompted to decide for program termination ("Y" or default response) or for the processing of more data ("N" for No termination). If the latter response is chosen, REEDS begins again. Otherwise, the CRT screen is cleared, and the common disk file is purged. Finally, all program ID segments in the REEDS series are removed from core ("OFF'ed" -- the reverse of the "RP" operation -- see File Manager or Terminal User's manual). The program STOP is executed and REEDS is terminated.

## 2.1.2 The RCLDS Cloud Rise Module

The RCLDS Cloud Rise Module models the thermodynamic phase of the REEDS code. In so doing, the meteorology, energy, and potential temperature factors



are calculated. Then the range from the pad of the cloud center, the cloud transport direction, stabilization height, and surface mixing layer depth are calculated. These are necessary for the formation of one of the more significant calculations — the wind azimuth uncertainty. This parameter is an important driver of the turbulent diffusion process. Once the surface mixing layer height is estimated and optimally refined, the RMTPS module is called to plot the pertinent geometric relationships and display the input meteorology and calculated potential temperature. The program is then ready for the kinetic phase of the calculation.

<u>Data File Reads</u>. The prompt for the surface layer height is transferred from the RCLDS question file, "?RCLDS" (Figure 4), to a holding array via the DREAD subroutine. The common disk file "=REEDS," is then read, some local variables and display flags initialized, and the exhaust cloud print header is written to the printing device.

Useful Constant Terms for the Meteorological/Energy Factors. In preparation for the calculation of the stabilized height and cloud rise energy factor, two terms useful for the calculation at a meteorological factor for bouyant rise,

and

$$\frac{.05129 (T - 273.16)^{p_0} \Upsilon}{Qc_1}$$

are calculated.

Adiabatic or Stable Cloud Rise. Next, a loop is performed through the meteorological layers to simulate the cloud rise phenomenon, either adiabatic or stable. The criteria is the argument of the inverse cosine (ARCCOS) term in the bouyant cloud use equation. If the argument is less than (-1), then the rise is "stable," and the flag so indicating, IAS, is set to 1; otherwise, the rise is "adiabatic," and IAS is 0. IAS is initialized in each layer to 1 ("stable" cloud rise).



Cloud Stabilization and Criteria for Surface Mixing Layer Height Selection. The slope (derivative with respect to altitude) of potential temperature (i.e., the "Lapse Rate"), the wind speed, and wind direction, in each layer are then calculated. The reader may recall the optional methods of calculating the lapse rate set up by the executive module, REEDS. If the least squares method (resulting in a lower cloud rise) is selected, a parameter IPTZ was set to 0. Otherwise, the alternate method of determining the lapse rate was chosen (IPTZ = 1), and is now calculated. In either case, a lapse rate is determined, and the energy factor calculated:

$$\alpha = \frac{\alpha_{c}(Z_{i}-Z_{0})}{\Delta t_{R}},$$

where  $Z_1$  and  $Z_0$  are the current and initial layer altitudes, and  $\Delta t_R$  is the deposition time for the launch vehicle as defined by the vehicle's time versus altitude profile. The stability factor, STAB, is calculated from either lapse rate, determining adiabatic (STAB  $\leq$  0) or stable (STAB > 0,  $[1 - \frac{1}{2}] \alpha$  STAB] < -1) rise. If the rise is adiabatic, the rise time through the current layer is merely

In addition to determining cloud rise, the three slopes calculated above become input factors to a deterministic calculation of the estimated surface mixing layer height to be performed after the conclusion of the rise loop and final stabilization height calculation:

Stabilization Range and Transport Direction. As the cloud rises through the meteorological layers, the wind speed and direction change. This affects the cloud direction and resultant position, so these effects are determined. This results in a transport direction and a stabilization range



increment. At the conclusion of this loop, a stabilization range and height are calculated. Later, the range and direction will be averaged over the rise to produce a net direction throughout the single surface mixing layer.

Mixing Layer Height. Subroutine FTOP is then called to estimate the height of the surface mixing layer. To do this, the slopes of potential temperature, wind speed, and wind direction versus time are examined for "significant" changes. Just what is significant is somewhat subjective. Currently, three slope change magnitudes are stored in a data statement. They are:

$$|\Delta \frac{d(PT)}{dZ}| = 0.03$$

$$|\Delta \frac{d\hat{u}}{dZ}| = 0.015$$

$$|\Delta \frac{d\hat{\theta}}{dZ}| = 0.015$$

for potential temperature, wind speed, and wind direction, respectively. When these are exceeded by the respective slope changes, the changes are considered "significant."

If no significant changes are found, the mixing layer height is set to twice the stabilization height. If only one of the variables has a significant change, the altitude of that change is selected. If there are more than one, they are sorted in descending order of magnitude. If there is an altitude at which all three variables have significant changes, this altitude is chosen. If, instead, there are two with coincident altitudes of significance, that altitude is chosen. If there are multiple multi-variable altitudes of significance, or several different altitudes which are non-coincident, then the largest change is selected. The following list summarizes the selection priority:

- 1) The largest triple variable coincident significant change.
- 2) The largest double variable coincident significant change.



- 3) The largest potential temperature significant change.
- 4) The altitude of the single significant change.
- 5) Twice the stabilization altitude.

Wind Azimuth Uncertainty. A very important driver of the turbulent diffusion process is the wind azimuth uncertainty  $(\sigma_{Az})$ . This variable is computed by the subroutine "RSGAZ," using a theoretical and deterministic method developed by Panofsky from similarity theory. The alternative to a method such as this would be a statistical method. However, with soundings often used as input meteorological sources, resolution at near-surface altitudes may not be good. This is greatly improved with tower data. Nevertheless, the similarity theory-based deterministic method is an important contribution for predictive application to single layer turbulent diffusion.

The value of  $\sigma_{Az}$  depends on the value selected from FTOP for the top of the surface mixing layer. That height is not final (i.e., it may be changed by the user if the Research or Operational mode is used, so final calculation of  $\sigma_{Az}$  occurs when the mixing layer height is accepted. The form used for  $\sigma_{Az}$  is

$$\sigma_{Az} = \frac{\sigma_{V}}{\overline{u}} = \frac{kf(B)}{\ln(z/z_{o}) - \psi(R_{I})},$$

σ<sub>V</sub> = standard deviation of lateral component of turbulence (m/sec)

mean wind speed (m/sec)

k = Von Karman's constant (=.4)

f(B)  $\Rightarrow$  Piecewise linear fit to experimentally measured values of  $\sigma v/_U$  as a function of the non-dimensional stability ratio, B

z = altitude (m;

 $z_0$  = roughness length (m)

 $\psi$ (RI) = a universal function of the Richardson number.



This relation was derived by Lettau (unpublished) and Panofsky (1963), serving both stable and adiabatic atmospheres (International Journal of Air and Water Pollution, Vol. 9, 1965, Panofsky and Prusad on "Similarity Theory and Diffusion"). The non-dimensional stability ratio, B, is given by

$$B = \frac{q \overline{Z}^2}{T \overline{U}^2} \frac{\Delta(P_T)}{\Delta z}$$

where g = gravitational acceleration (m/sec<sup>2</sup>)

 $\overline{Z}$  = the geometric mean of layer top and bottom (m)

mean wind speed (this layer) (m/sec)

T = absolute temperature (OK)

 $\Delta P/_{\Delta Z}$  = lapse rate (vertical gradient of potential temperature).

Depending on the value of B, f(B) is selected from

$$f(B) = a + b (B + c)$$
, where

The Richardson number for  $\psi(RI)$  cannot be calculated from its definition (normalized lapse rate per unit vertical wind speed gradient squared), because sufficiently accurate measurements of the vertical wind speed gradient do not normally exist. It can be transcendentally obtained from:

$$R_{I} = B \left[ \frac{\ln(z/z_{0}) - \psi(R_{I})}{\phi(R_{I})} \right]^{2}$$

where (RI) =  $(1-16 R_1)^{-\frac{1}{4}}$ , unstable conditions  $(1-7RI)^{-\frac{1}{4}}$ , stable conditions

(another universal function),



and

$$\psi(RI) = \ln \frac{1+\chi}{2} + \ln \frac{1+\chi^2}{2} + \frac{\pi}{2} - 2 \operatorname{Tan}^{-1}(x), \text{ unstable condition}$$

$$= 7 \operatorname{R}_{I}(1-7\operatorname{RI})^{-1}, \text{ stable conditions}$$

where  $X = (1-16RI)^{\frac{1}{4}}$ .

For stable conditions,

$$\sqrt{RI} = (-1 + \sqrt{1 + 4 A_1 A_3})/2A_1$$

where  $A_1 = 7$  Bk, and  $A_3 = -B(k-1)$ , for  $k = \ln Z/Z_0$ .

For unstable conditions,

$$\frac{(1-x)^4}{16 \ X^2 [\ln z/z_0 + .50864 - 2 \ln (1+x) - \ln(1+x^2) + 2\tan^{-1}x]} - B = 0$$

is solved transcendentally for X, which yields RI.

In RSGAZ, the transcendental function statement and its necessary derivative precede the active statements (follow the detailed flow chart in Figure 2-5). The critical data (transferred via common) is selected from the input layers as a result of the input arguments passed. The potential temperature gradient (Lapse Rate) is then calculated at the indicated altitudes, followed by the Richardson number for either stable or unstable conditions. The appropriate value of f(B) is then obtained for the final calculation of  $\sigma_{AZ}$ . The value of  $\sigma_{AZ}$  returned is constrained between the limits of 7 degrees and 30 degrees, to keep resultant uncertainties physically realizable.

Interactive Alteration of the Surface Mixing Layer Height and the Wind Azimuth Uncertainty. Once the mixing layer height and subsequent wind azimuth uncertainty are estimated by the program, the user is given the opportunity to change each, if the RESEARCH or OPERATIONAL mode has been chosen. In the production mode, the user must enter both. The user is first prompted to use the estimated layer height or an altered value. If the altered value choice is

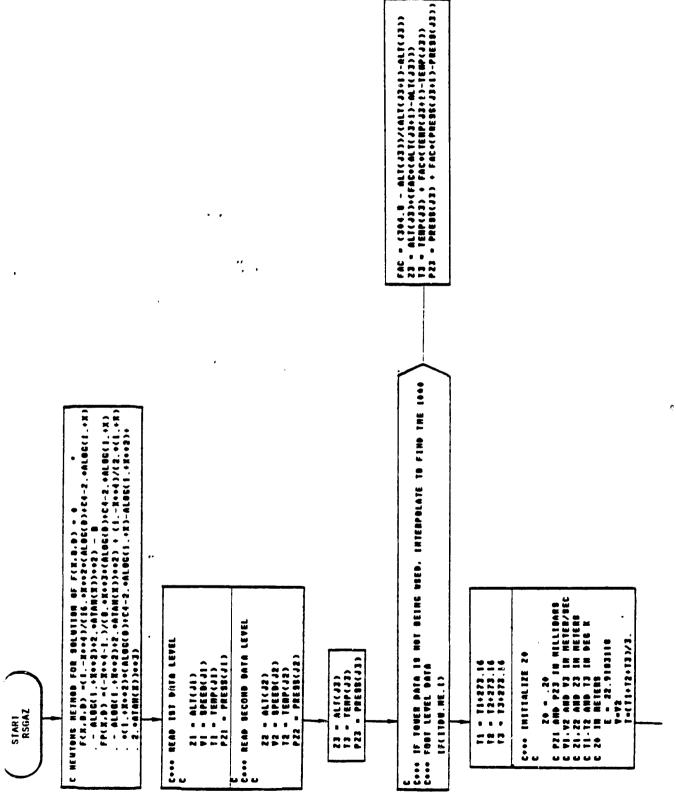
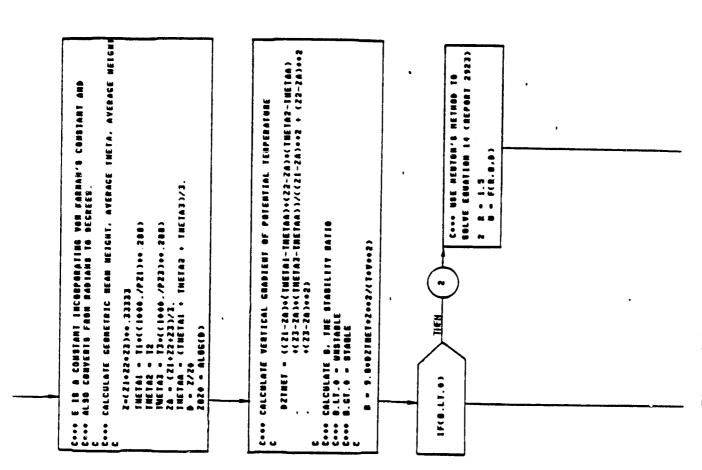
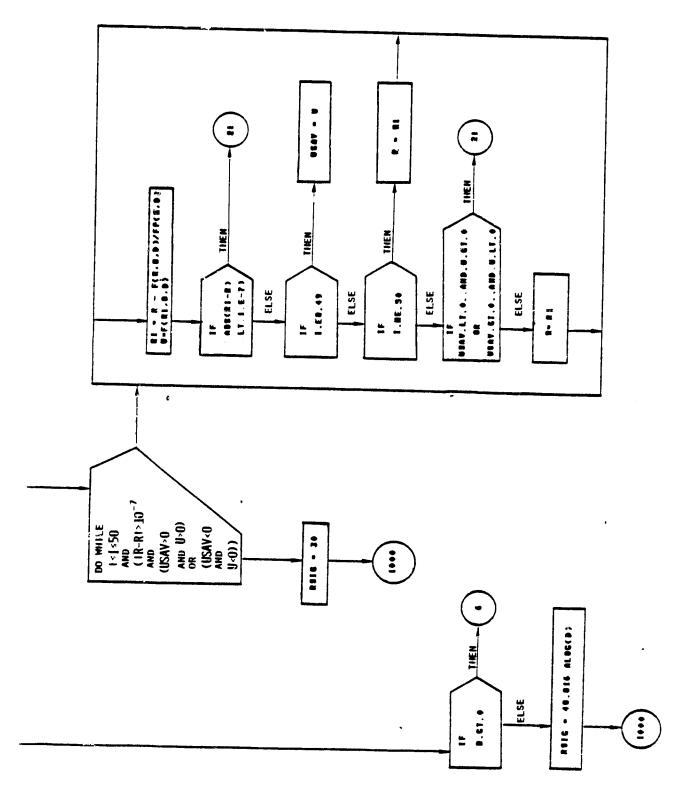


Figure 2-5. Detailed Structure Flow Diagram of Subroutine RSGAZ

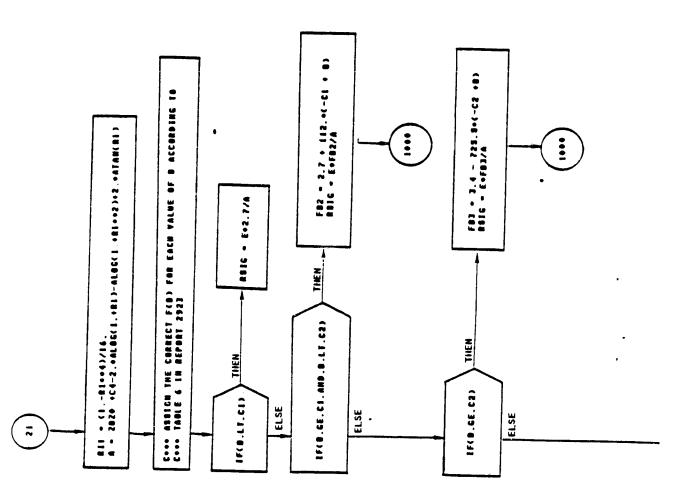
# ORIGINAL PAGE IS OF POOR QUALITY



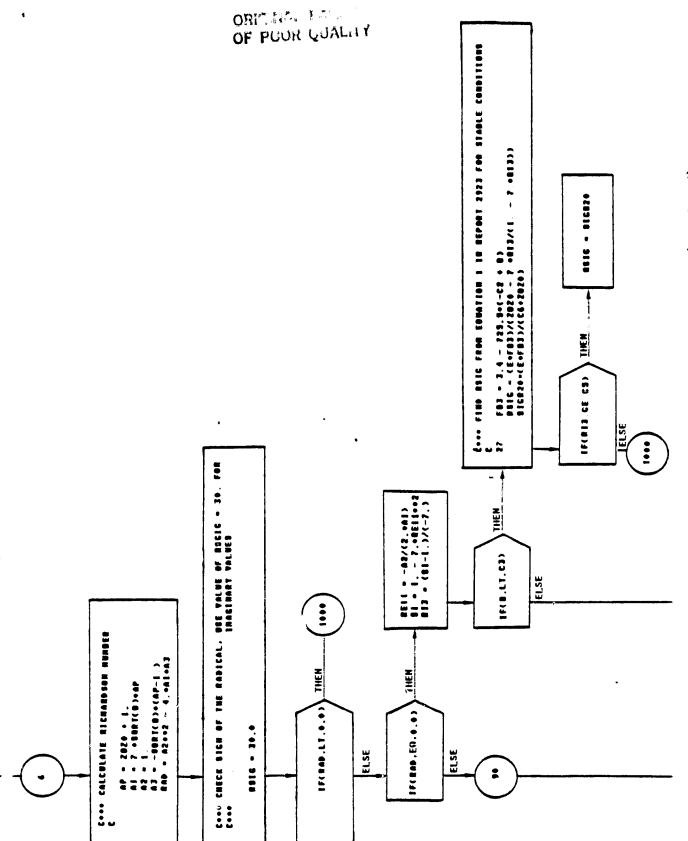
Detailed Structure Flow Diagram of Subroutine RSGAZ (continued) Figure 2-5.



Detailed Structure Flow Diagram of Subroutine RSGAZ (continued) Figure 2-5.

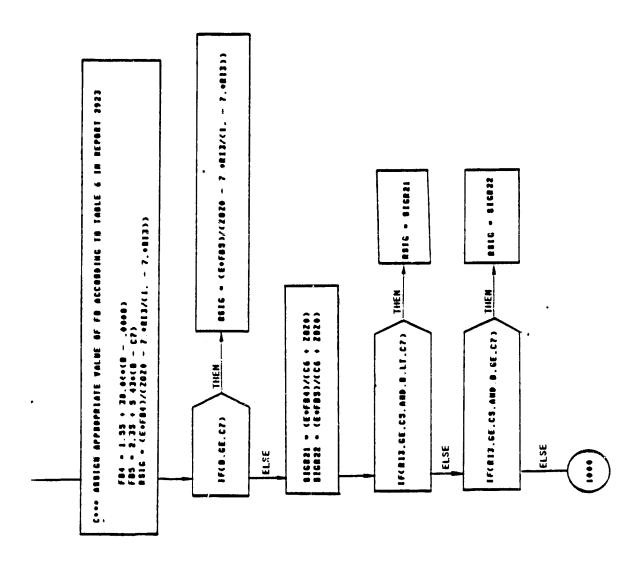


Detailed Structure Flow Daigram of Subroutine RSGAZ (continued) Figure 2-5.

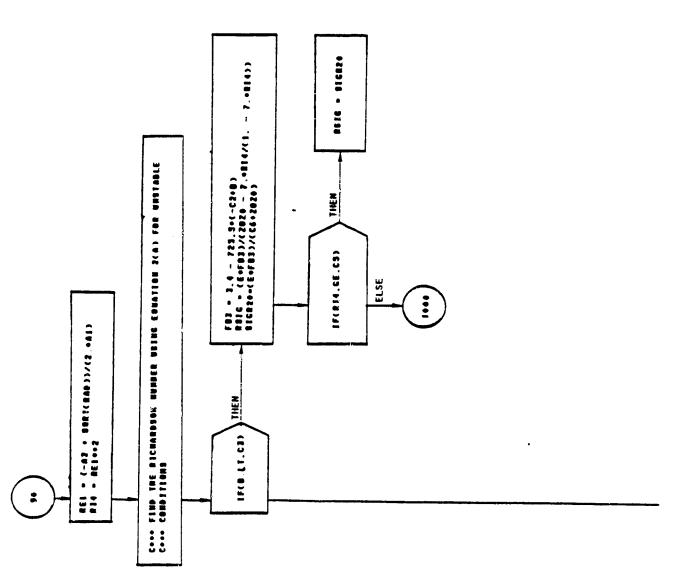


Detailed Structure Flow Diagram of Subroutine RSGAZ (continued) Figure 2-5.

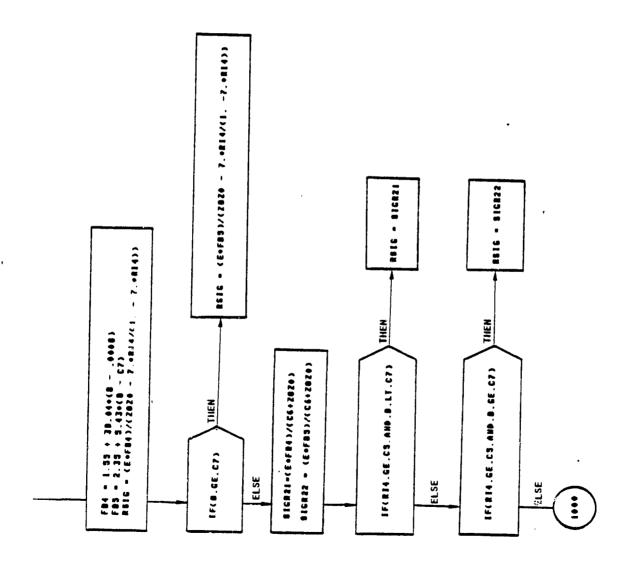
## ORIGINAL PAGE IS OF POOR QUALITY



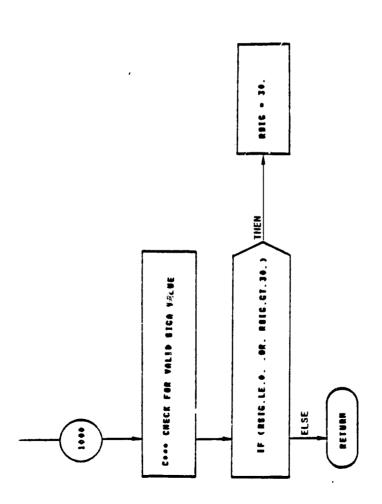
Detailed Structure Flow Diagram of Subroutine RSGAZ (continued) Figure 2-5.



Detailed Structure Flow Diagram of Subroutine RSGAZ (continued) Figure 2-5.



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Detailed Structure Flow Diagram of Subroutine RSGAZ (concluded) Figure 2-5.



selected (via entry of an integer > 8) an interactive selection of the layer height is assumed. In either case, the common data are written to "=REEDS," and the meteorological data plotting routine "RMTPS" is called. Upon conclusion of RMTPS, control is returned to RCLDS. If met plots only were desired, the call to "RMTPS" is followed by a program STOP for immediate termination of execution. Otherwise, the height selected during "RMTPS" becomes the estimated mixing layer height for the balance of the calculations.

<u>Contaminant Source Strength</u>. Calculation of the mixing layer height determines the source strength of HCL (from which the other contaminant strengths are determined) in that it determines the maximum altitude over which the rocket vehicle effluent production algorithm may operate; contaminants dumped above the surface mixing layer are not permitted to diffuse into the layer.

<u>Stabilization.</u> Definition of the mixing layer height also permits correct averaging of transport speed and direction over the layers within the mixing layer, so this is accomplished and the results written on the selected printing device. The user is then given the chance to change the wind azimuth uncertainty, if the RESEARCH or OPERATIONAL mode is active. If not "N" for No, the user enters the uncertainty desired in wind azimuth (degrees) and  $\sigma_{Az}$  is printed on the printing device. Since the mixing layer height selected ( $H_T$ ) may have resulted in part of the cloud being above the mixing layer top, and therefore being discarded, the "effective" stabilization heat ( $H_{SE}$ ) of a "revised" cloud containing only that portion within the mixing layer must be calculated. This is done according to

$$H_{SE} = \begin{cases} \frac{H_{T} + H_{S} - R_{C}}{2}, & H_{T} - H_{S} \leq R_{C} \\ \frac{H_{T}}{2}, & [H_{T} - H_{S}] > R_{C} \end{cases}$$

where  $H_{S}$  is the stabilization height and  $R_{C}$  the cloud radius.



Similarly, the vertical extent from cloud center  $(\sigma_{Zo})$  is calculated as

$$\sigma_{zo} = \frac{H_T - H_S + R_C}{4.3} \cdot \frac{H_S + R_C \ge H_T}{\sigma_{zo} > 0}$$

$$= \sigma_{Xo} = \frac{\gamma_M H_S}{4.30} \cdot \frac{H_S + R_C < H_T}{\sigma_{zo} \le 0}$$

where  $\sigma_{\chi_0}$  is the initial cloud radius.

The stabilization height is written to the printing device, the common data are written to the disk file, and the effluent concentration module "RCONS" is called. Following this, a program STOP is generated, returning control to the "REEDS" executive module.

### 2.1.3 The RMTPS Meteorological Data Plotting Module

The "RMTPS" module generates a plot of the Meteorological Profile Variables of wind speed and wind direction as a function of altitude, and the initial and effective stabilized cloud shape. The mixing layer is also indicated on the plot and can be interactively determined from user input. As an additional feature, the sounding (or other) sampling points are indicated as additional tic marks on the ordinate altitude scale. The "RMTPS" module also will draw the met plot forms if the user has selected that option in "REEDS."

<u>Forms Generation</u>. After the common disk file is read to load the common data, the RMTPS module checks for the forms switch, MFORM. If on (MFORM = 1), the form is generated; the first two hundred active lines (or so) are dedicated to this purpose.

Met Plots. After the forms are generated, or when forms generation is bypassed, the MONLY common parameter (OPTION control pseudo-block) is checked to see if MET plots are skipped altogether (or in a forms generation run or in a repeat run designed to prevent needless replotting of the MET-related data). The wind direction data is rotated to conform to the preset site orientation, and is scaled to plot units. The launch data and time, site data, surface pressure and



density, stabilization height and wind azimuth uncertainty are all encoded into ASCII character strings and written by the plotter onto the MET plot. This is followed by the dry temperature, potential temperature, wind speed, and wind direction (all surface values), which are likewise encoded and written by the plotter. In each case, the encoding is accomplished by the combination of "CODE" calls and subsequent WRITE to the character string, IALPHA. The character string is then written at the designated plotter location via the "CHAR" subroutine.

Curve Drawing. Actual curve drawing then proceeds by pulling the array values for the various arrays out and using them as data for the "CHAR" calls. This results in the indicated symbol from the symbol array ICRVT being plotted. In the case of the line plots, either "LINE" (for solid lines) or "DLINE" for dashed lines are used for curve generation on the plotter.

Axis/Tic Marks. Curve drawing is then followed by axis generation. This is accomplished with simpler calls to LINE, whether for axes or for tic marks.

<u>Cloud Drawing</u>. The cloud schematic is drawn by the "CLOUD" subroutine in the lower right quadrant of the plot. Relative distances with respect to mixing layer are kept to approximate scales.

Mixing Layer Height. At the appropriate height on the altitude scale (ordinate), the estimated mixing layer is drawn with the "LINE" routine. The "MOVEM" subroutine is then called to prompt the user to accept or replace the indicated height. The choices are:

"CO" for continue

"UP" for move up one met level

"DO" for move down one met level

After each prompting, the new line is drawn in. When it is finally accepted by entering "CO," the line is labeled by the encoded layer height (meters).

Effective Cloud. Some cloud parameters (radius, height, etc.), calculated in RCLDS but not saved, are recalculated. This permits redrawing the cloud schematic with the "effective" parameter. This time, however, the "LINE" routine is used with the cloud extent data to produce a shaded ellipse superimposed over the original cloud outline. After this operation, the common data are written to the disk file and a program "STOP" is generated, returning control to "RCLDS."

### 2.1.4 The RCONS Centerline Concentration Module

The RCONS concentration module computes the range and azimuth of the cloud center relative to the pad, calculates and plots the centerline dose and concentration of the major hazardous effluents, computes the off-centerline dose and concentration for specific locations, and calls the "RISOS" dosage and concentration isopleth plotting module. The "RCONS"/"RISOS" combination comprises the "kinematic phase" of the effluent diffusion problem. Refer to Figure 2-3 for the RCONS top-level flow.

The turbulent diffusion problem may be described by the following diffusion equation:

$$\frac{2\chi(\overline{r},t)}{2t} + \langle \overline{v} \rangle \cdot \nabla \chi(\overline{r},t) = \nabla \cdot \left[ \tilde{K}(\overline{r},t,p,T) \cdot \nabla \chi(\overline{r},t) \right]$$

where  $(\hat{r},t)$  is the scaler concentration of the diffusing effluents,  $\langle v \rangle$  the expected value of the wind velocity and  $\hat{K}$  (r,t,P,T) the diffusion diagonal tensor which is a function of temperature, pressure, position and time. The separation of the problem into two (2) distinct phases, a thermodynamic phase resulting in approximate equilibrium with the ambient environment and a kinematic phase, with diffusion from the thermodynamically stable state, facilitates the linearization of the equation and subsequent separation of variables solution. We have already looked at the first phase (RCLDS), and now wish to examine the latter.

The first phase left the exhaust cloud initially spherical in shape with the cloud center at a stabilized altitude. Then, the revision of the cloud occurred to account for surface mixing layer effects. Now, the ellipsoidal expansion of the revised cloud occurs. The generalized dosage equation driving this expansion is composed of four terms:

In subsequent modeling, the depletion of material from the cloud by gravitational settling and rain scavenging is included, but in the current REEDS model, no

depletion of this type is included. Therefore, the driving dosage algorithm is:

$$\begin{split} & \mathbb{D}\left\{x,\,y,\,z_{B} < z < z_{T}\right\} = \frac{Q_{M}}{2\pi\,\sigma_{y}\,\sigma_{z}\,\overline{u}}\,\left\{\exp\left[\frac{-y^{2}}{2\sigma_{y}^{2}}\right]\right\} \left(\exp\left[\frac{-(H-z)^{2}}{2\sigma_{z}^{2}}\right] \\ & + \exp\left[\frac{-(H-2z_{B}+z)^{2}}{2\sigma_{z}^{2}}\right] + \sum_{i=1}^{\infty} \left\{\exp\left[\frac{-\left[2i(z_{T}-z_{B})-(H-2z_{B}+z)\right]^{2}}{2\sigma_{z}^{2}}\right] \\ & + \exp\left[\frac{-\left[2i(z_{T}-z_{B})+(H-z)\right]^{2}}{2\sigma_{z}^{2}}\right] + \exp\left[\frac{-\left[2i(z_{T}-z_{B})-(H-z)\right]^{2}}{2\sigma_{z}^{2}}\right] \\ & + \exp\left[\frac{-\left[2i(z_{T}-z_{B})+(H-2z_{B}+z)\right]^{2}}{2\sigma_{z}^{2}}\right] \right\} \end{split}$$

where:

 $Q_{M}$  = Source Strength (total mass in the indicated surface layer)

T,B subscripts indicate top and bottom of stabilized cloud, respectively.

H = Height of Cloud Centroid

Z = Height within layer  $(z_B \le z \le z_T)$ 

 $\sigma_y$ ,  $\sigma_z$  = Standard Deviation of the Time Dependent Cloud Dimensions in the y and z directions, respectively.

Centerline values are obtained at y = 0, while surface values are obtained at z = 0. From the dosage, the concentration is formed by the expanding front as

$$\chi(x,y,z,t) = \frac{D(x,y,z,t)}{2\pi} \overline{U}$$



where  $\overline{U}$  is the average wind speed, and  $\sigma_{\chi}$  is the along-wind cloud dimension. The balance of the kinematic phase modules are concerned with establishing positions and timings relative to the cloud center and time of maximum dosage/concentration, and the relative distribution of dosage/concentrations among the effluent constituents.

Centerline Dosages and Concentrations. After some input terminal initialization, the standard common disk file read, and some useful parameter initialization, the range down the cloud centerline is computed and expressed relative to the pad. The dosage algorithm "guts" exists in subroutine DFEXP, where the various sums in the above equation are computed. DFEXP is called with y = 0 off centerline distance to obtain the centerline maximum dose and concentration. The arguments of DFEXP are the surface mixing layer height and the concentration desired. DFEXP can then obtain the appropriate dimensions corresponding to that concentration. However, the specification of the number 1000 for concentration is a key that causes DFEXP to produce only values at the indicated range, and report the standard deviation of the cloud dimensions in the transverse direction.

Cloud Leng'n and Arrival/Departure Time. Based on the calculations of cloud extent made by DFEXP, the arrival and departure times at the indicated range are computed and printed with the range and azimuth relative to the pad, at 250 meter increments along the cloud centerline.

RCONS User Prompts. Most prompts for RCONS user action are stored in the RCONS question file "?RCONS," and are accessed via the DREAD subroutine.

Centerline Plots. If the current operational mode is not production, the user is then prompted to decide whether or not to produce actual plots of the centerline dosage and concentration. If the response is not "N" for no, subroutine CPLOT is called with the centerline range array generated above. The plot is generated with a pre-set scale factor in order to coincide with traditionally generated forms. The default response to the centerline plot prompt is "YES."

Maximum Dosaye/Concentration. The maximum dosage and concentration will occur along the cloud centerline. The point at ground level where this occurs had been calculated and saved during the above centerline dosage/concen



tration calculation. They are now written out on the printing device selected with pad-relative range and azimuth.

Off-Centerline Concentrations/Dosages. If the current operating mode is PRODUCTION, the run is effectively complete and transfer of control is to the end of RCONS, and ultimately to the REEDS executive module for termination or restart. If the current mode is not PRODUCTION, however, the user is prompted for "off-centerline dosages/concentrations." If the answer is not "N" for "No." off-centerline concentrations/dosages are assumed to be desired (which is the default case), and the ORIGIN subroutine is called to set the origin for the desired launch pad and map. Application of the REEDS code to other sites can be accomplished by appropriately modifying the vehicle/pad association data in the ORIGIN subroutine. From ORIGIN, the user is prompted for the pad number and land/sea map combination. The choices are listed by the prompt, depending on the vehicle selected during REEDS input (certain vehicles imply certain pads). The user then inputs the code listed in the prompt which corresponds to the pad/map combination he desires. The user will now be prompted for pad-relative offcenterline ranges and azimuth. However, if the operating mode is RESEARCH, the user is first prompted (from the program) to enter a cloud centerline (stabilization-relative) range. This is then transformed to a pad-relative range and azimuth using the setup from ORIGIN. This is an aid in the verification of data from the centerline calculations and/or an additional centerline/off-centerline consistency check. In either RESEARCH or OPERATIONAL modes, the user is then prompted for the pad-relative range followed by the padrelative azimuth. The entered range and azimuth are printed on the terminal display, and then on the printing device. The coordinates are plotted on the Isopleth plotting map requested by ORIGIN according to the setup resulting from the requested pad/map combination. The point is labeled by the ordinate number of the range/azimuth pair (first entry = 1, second entry = 2, etc.). additional points are then computed at the requested range, but the first at  $10^{\circ}$ less azimuth and the second at 10° more azimuth. All three range/azimuth pairs are then transformed to cloud center-relative coordinates, and DFEXP is called. The concentration and dosage is evaluated at each point and the  $\pm 10^{\circ}$  data used to produce an uncertainty in the concentration/dosage for each effluent. resulting data is printed on the printing device. The format is:



MATERIAL CONCENTRATION + CONCENTRATION DOSAGE + DOSAGE UNCERTAINTY (PPM-SEC) UNCERTAINTY (PPM-SEC)

The above off-centerline calculation is repeated until a zero (0) range is entered.

<u>Isopleth Plotting</u>. The user is then prompted for Isopleth plotting. If the answer is not "N" for "No," the Isopleth plotting module is scheduled, otherwise RCONS is terminated and control returns to REEDS through RCLDS, for program termination/restart.

## 2.1.5 The RISOS Isopleth Plotting Module

The RISOS module essentially repeats off-centerline calculations using DFEXP, except it uses a clever series of calls resulting in iso-concentration contours. Refer to Figure 2.3 for RISOS top level flow.

<u>Isopleth Initialization</u>. The user terminal is first initialized and the common data read from disk via subroutine BWDIS. The ORIGIN subroutine is called again in case the call in RCONS was bypassed by rejection of the off-centerline option. This makes sure the plotting origin is established relative to the vehicle pad/map configuration desired.

Cloud Rise Ground Track. The cloud rise ground track from the pad to stabilization is then plotted by calculating the range of the cloud centroid from the time required to rise through each meteorological layer. The times for each layer were stored during the cloud rise module (RCLDS) execution. The average wind velocity in each layer is integrated over the stored time to provide the incremental range that is plotted. Since the wind velocity is measured "from" the source, the cloud transport direction must use a factor of  $\pi$  to properly orient its movement. The process is terminated when the layer containing the stabilized cloud center is reached. However, an additional segment is required, because of the use of the "effective" stabilization height, which replaced the stabilization height when placement of the surface mixing layer height severed part of the cloud (for diffusion purposes). The stabilization point is then labeled with a "+." Next, the point of maximum concentration at ground level. stored during RCONS, is labeled with an "@." Finally, the cloud track downwind from stabilization is plotted with a straight line using the transport direction from that point.

#### 3.0 REEDS OPERATION

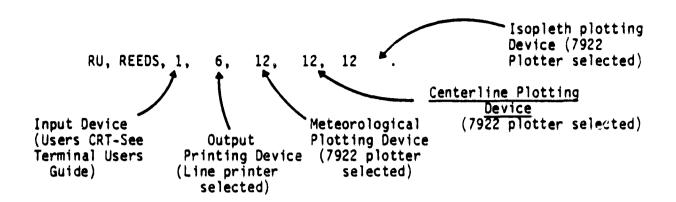
The basic form of storage for REEDS is in the form of source code files for the program/subroutine packages and ASCII data files for the input data. Ultimately, the source code files are compiled and thereby translated into machine language modules. The latter are loaded, SP'd, OF'd and RP'd (see terminal users manual). The "RU" command is then used to execute the RP'd modules while arguments are used to pass special information to the program. The compiled, loaded, and SP'd files are convenient to use, since they merely have to be RP'd prior to execution -- a very quick process. One drawback is that there is little way of verifying that the RP'd module is the result of the source file as it appears. Also, since source files must be saved anyway, the existence of a large compiled file may seem redundant, especially if not used often. Nevertheless, because of the lengthy loading process, the compiled files are often stored. Thus, for purposes of showing a run, the compiled files are assumed to exist in the RP'd state. Maintenance files have been built which automatically perform the operations leading to an RP'd program. purpose of this section to explain actual REEDS execution.

#### 3.1 THE TEST CASE

A test case was chosen, using the space shuttle as the vehicle and the 8 A.M. EDT 16 November 1969 rawinsonde as the meteorology. The file name of the latter data was changed to DATAO1, just for convenience, and can be seen in Section 4.4 of this report. The CRT terminal used was equipped with a hardcopy device, making it possible to get intermittent copies of the screen to aid the narration.

Run Time Parameters. The REEDS system was designed to serve MSFC research needs and KSC operational needs. One difference between these is that KSC has three plotters, each one assigned to a major plot output. MSFC has one plotter for all three plots. The allocation in the run statement of printing and plotting devices to logical units makes this possible. The user enters:





At this time the screen appears as in Figure 3-1. The default responses are indicated on the CRT screen when they appear by easily noted enhanced characters.

Operational Configuration. The next five (5) entries deal with configuring the logical path through the modules. The first prompt asks about the low altitude curve fit. We choose not to use the least squares fit for the potential temperature gradient and answer "No." We have renamed the 16 Nov 1969 rawinsonde file DATAO1 for this run, and therefore select the default, "YES," response for the meteorological data file name (response-2). For the third input, the default OPERATIONAL mode is chosen, followed by a similar choice for Met Plot Form rejection (4th) and Met plot creation (5th). The printer output default ("Yes") is selected, and the screen appears as in Figure 3-2.

Launch Specific Parameters. The default launch time is the current time on the computer's system clock. It was decided to select the time rather than enter either a realistic or other time. Likewise, the default vehicle (space shuttle) is chosen as the launch vehicle. At this point, the screen appears as in Figure 3-3.

<u>Initial Printed Output</u>. At this point, the initial printer data becomes available, printing the header and meteorological sounding data as shown in Figure 3-4. The printout reflects all input entered to date, except the Met. Plot Form/Met. Plot configurational data.

Estimated Mixing Layer Height. The RCLDS cloud rise module has estimated the height of the top of the surface mixing layer, printing 2552 meters on the screen. The user is then prompted to raise or lower this height. The cloud rise has been calculated and stored up to this height, and RMTPS has been called.

RU, REEDS, 1, 6, 12, 12, 12

# \*\*\*\*\*NASA/MSFC EXPERIMENTAL MULTILAYER DIFFU15 AUG 1981\*\*\*\*

Figure 3-1. Code Initiation

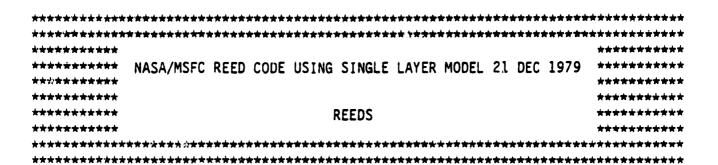
*****NASA/MSFC EXPERIMENTAL MULTILAYER DIFFU15 AUG DO YOU WANT THE LOW ALT. CURVE FIT? YES NO NO	1981****
LOW ALTITUDE CURVE FIT	NO
USE DEFAULT COMMON DATA FILE (DATAØ1) ?	YES
RUN TYPE: OPERATIONAL	
GENERATE THE MET PLOT FORM?	NO
MET PLOTS?	YES
GENERATE PRINTER OUTPUT?	YES
DEFAULT LAUNCH TIME/DATE? 1833 CDT 15 AUG 1981	YES NO

Figure 3-2. Configurational Paths Added



\*\*\*\*\*\* DIFFU15 AUG 1981\*\*\*\* DO YOU WANT THE LOW ALT. CURVE FIT? YES NO LOW ALTITUDE CURVE FIT USE DEFAULT COMMON DATA FILE (DATAØ1) YES RUN TYPE: **OPERATIONAL** GENERATE THE MET PLOT FORM? NO MET PLOTS? YES GENERATE PRINTER OUTPUT? YES DEFAULT LAUNCH TIME/DATE? 1833 CDT 15 AUG 1981 YĒŠ NŌ SELECT LAUNCH VEHICLE: SHUTTLE=S ESTIMATED TOP OF SURFACE LAYER(M) IS: 2552.4 MOVE TOP OF SURFACE LAYER: UP DOWN CONTINUE

Figure 3-3. Launch Specific Data Added



RUN 1 USING DATA FILE DATAO1

SHUTTLE LAUNCH VEHICLE

PREDICTION TIME: 1007 CDT DATE: 24 AUG 1981

DATA FILE HEADER INFORMATION: TEST NBR 03717 04834 0-24HR RAWINSONDE RUN AN/GMD-4 CAPE CANAVERAL AFS, FLORIDA

ASCENT NBR 0543

TIME: 800 EDT DATE: 16 NOV 1969

SURFACE DENSITY (GM/M\*\*3): 1273.00

2586

41

12

8485

LAYER NO.	ALTI (FEET)	TUDE (METERS)	DIRECTION (DEGREES)	SPEED (M/SEC)	TEMP ( DEG	POT-TEMP REES CENTRIGRADE	D P	TEMP	PRESSURE (MILLIBARS)
1	16	5	320	.4	7.1	4.96	23	.2	1027.
2	735	224	10	.8	9.6	9.60	22	, 9	1000.
3	754	230	10	.8	0.7	9.76	21	.7	<b>99</b> 9.3
4	2126	648	27	.7	6.5	10.66	16	.6	950.0
5	2172	662	28	.7	6.4	10.69	15	. 3	<b>9</b> 48.5
6	3579	1091	7	.4	6.3	14.91	13	.6	900.0
7	3629	1106	6	.3	6.3	15.04	13	.6	898.6
8	5121	1561	316	.3	7.2	20.63	10	.6	850.0
9	5960	1817	335	.2	7.7	23.78	8	.7	824.2
10	6754	2059	9	.2	6.4	24.96	10	.7	800.0
11	8374	2552	41	.1	4.9	28.51	7	.6	753.5

Figure 3-4. Initial Printer Data-Header and Meteorological Data

4.9

28.92

.1



3.5

750.0

Initial Plotter Output. The meteorological data are plotted, since Met. Plots were selected; however, the form is omitted because a blank form already exists and is used. The blank form appears in Figure 3-5. After the Meteorological data are plotted, the plot appears as in Figure 3-6. The estimated mixing layer top is drawn, but not labeled, and the meteorological sounding data points are indicated by the additional irregularly spaced tic marks on the left ordinate. The program is left in an input mode, awaiting instructions as to mixing layer height modification.

Mixing Layer Height Modification. As a demonstration of the program options rather than a reflection of reality, the cloud is shown stabilized at 871 meters, and the mixing layer height is dropped four (4) times to 1106 meters. As can be seen in Figure 3-7, this is accomplished by entering four (4) consecutive "DO"'s for (DOWN) and finally a "CO" (for continue).

<u>Final Cloud Rise</u>. With the mixing layer finalized, the cloud rise is modified to reflect "severing" of part of the cloud by the boundary and subsequent recalculation of the stabilization height (to become the "effective" height) and total rise time. The resulting "effective" cloud is shown in Figure 3-8, and the cloud rise summary data printed on the printer is shown in Figure 3-9.

<u>Final Wind Azimuth Uncertainty</u>. The wind azimuth uncertainty is calculated from the mixing layer height and printed on the terminal display (Figure 3-7). The user is given a chance to modify this value. As the figure shows, the estimated value was accepted.

Centerline Concentrations and Dosages. The table of calculated centerline HCL dosages and concentrations are printed as shown in Figure 3-10. The user is prompted for centerline plots of concentration and dosages. These are desired (Figure 3-11) so a blank centerline form is loaded onto the plotter (Figure 3-12). The centerline dosage and concentration are plotted on the plotter, and the plot is labeled (Figure 3-13). The maximum ground concentration and dosage are then printed on the printer, as are the pad-relative coordinate (Figure 3-14). All dosages and concentrations are HCl dosages and concentrations. All other effluents are determined from HCl, the chief effluent.



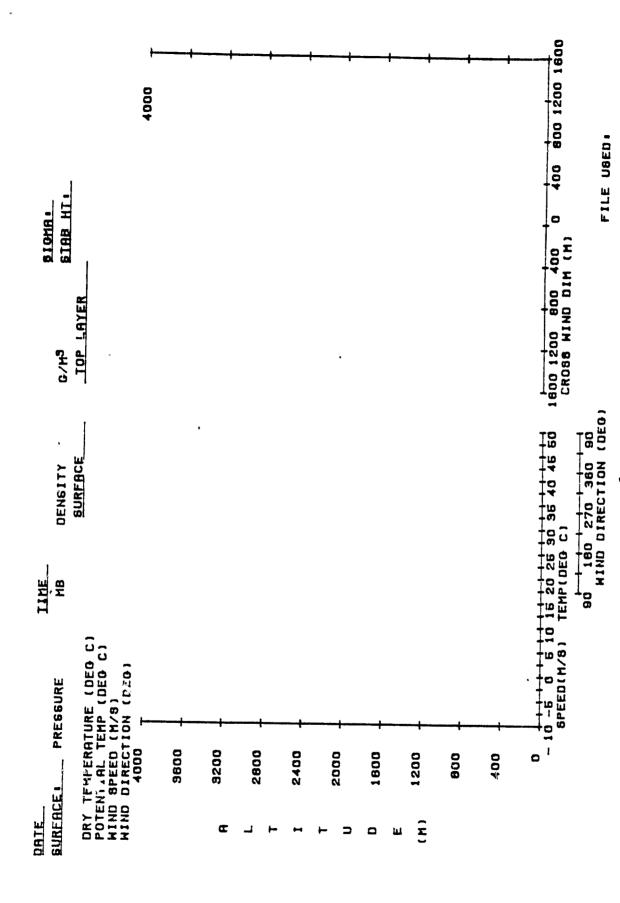


Figure 3-5. Blank Meteorological Form

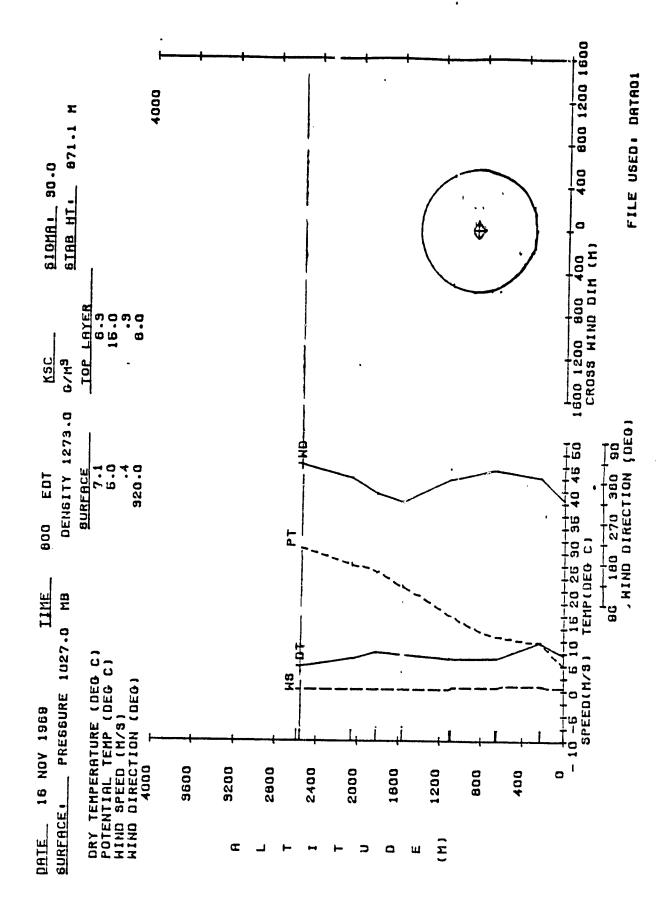


Figure 3-6. Meteorological and Initial Cloud Data Plotted with Estimated Mixing Layer Height

DO

DO DO DO CO

CALCULATED TOP OF SURFACE TRANSPORT LAYER IS: 1106.12

USE A SIGMA FOR WIND AZIMUTH ANGLE OF: 30.0 YES NO

USE A SIGMA FOR WIND AZIMUTH ANGLE OF: 30.0 YES

CENTERLINE CONCENTRATION PLOT DESIRED ? YES NO

Figure 3-7. Modifying the Mixing Layer Height

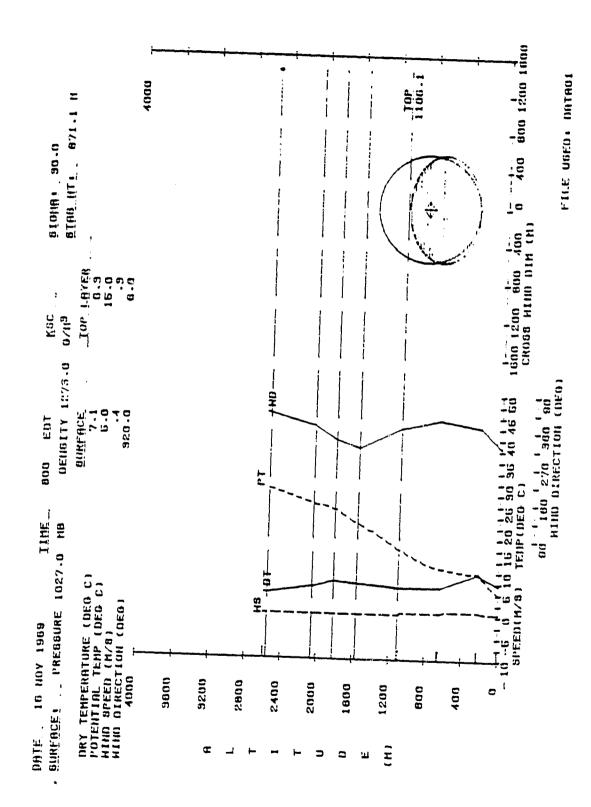


Figure 3-8. Modified Cloud - Showing Mixing Layer Height Effects

#### EXHAUST CLOUD

LEVEL	ALTITUDE (METERS)		RISE TIME (SECONDS)	RANGE (METERS)	DIRECTION (DEGREES)
2	224.0	STABLE	7.6	4.7	165.0
3	229.8	STABLE	8.0	5.0	166.5
4	648.0	STABLE	53.3	39.3	194.6
5	662.0	STABLE	55.5	40.8	195.1

\*\*\*\*CLOUD STABILIZATION\*\*\*\*

HEIGHT(M): 1004.2

STABILIZATION TIME AFTER LAUNCH(SEC): 174.0

RANGE FROM PAD(M): 111.7

DIRECTION FROM PAD(DEG): 195.3

PRESSURES ARE: 1027.00 1000.00 999.30

TBHT = .733812E+03

\*\*\*\*TOP OF SURFACE LAYER METEOROLOGICAL PARAMETERS\*\*\*\*

HEIGHT(M): 1106.1

WIND DIRECTION(DEG): 6. WIND SPEED(M/SEC): .3

\*\*\*\*DIFFUSION PARAMETERS\*\*\*\*

MEAN SPEED(M/SEC): .7

MEAN TRANSPORT DIRECTION(DEG): 191.3

SIGMA OF WIND AZIMUTH ANGLE, SIGAZ: 30.0

EFFECTIVE CLOUD HEIGHT (M): 733.8

Figure 3-9. Final Exhaust Cloud Rise Data

CLOUD CONCENTRATIONS AND DUSAGES

POSITION FRON PAD																						
FER LAUNCHOSEDS																						
TINE AFTER	STAR	921-	-261	1264	2790	4316	1+85	7367	8893	1501	76.1	1347	ののマー	1652	ナコのこ	1957	2105	2262	2415	2567	2720	2872
DUSAGE	(PPM SEC)	. 057	4379.79	5859,96	5066,42	4135.67	3435,43	2931.11	2555,21	2264.59	2033.24	1844.72	1688,16	1556.07	1443.14	1345,48	1260.19	1185, 07	1118.39	1058.82	1005.27	956,869
CONCENTRATION	( Ndd )	999.	3.831	5,126	4.432	3.618	3,665	2,564	2.235	1.98.1	1.779	1.614	1.477	1.361	1.262	1.127	1.102	1. (137	826.	. 526	628.	.837
DISTANCE	( NEIERS)		1000.0	2000.0	3000.0	4606.0	5000.0	6000.0	7000.0	8000.0	9000.0	1 ចំព័ច្ច , ចំ	11060.0	12600.0	13000.0	14000.0	15000.0	15000.0	17000.0	13000.0	15000.0	20000.0

Centerline Hcl Concentrations/Dosages with Cloud Arrival/Departure Times and Pad-Relative Positions figure 3-10.

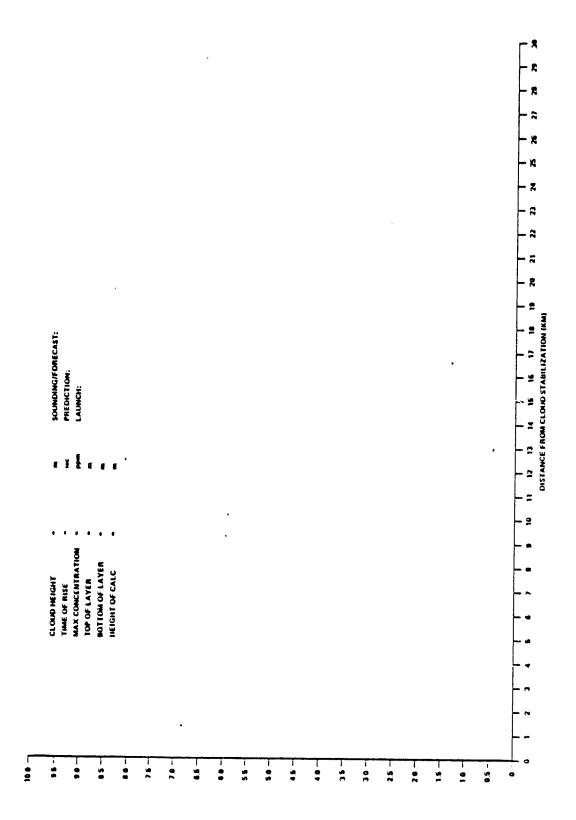


DO

D0 D0 D0 C0

CALCULATED TOP OF SURFACE TRANSPORT LAYER IS:	1106.12
USE A SIGMA FOR WIND AZIMUTH ANGLE OF: 30.0	YES NO
USE A SIGMA FOR WIND AZIMUTH ANGLE OF: 30.0	YES
CENTERLINE CONCENTRATION-PLOT DESIRED ?	YES NO
YES	
CENTERLINE CONCENTRATION PLOT DESIRED ?	YES

Figure 3-11. Centerline Concentration/Dosage Plots Added



Blank Form for Centerline Concentration/Dosage Plots Figure 3-12.

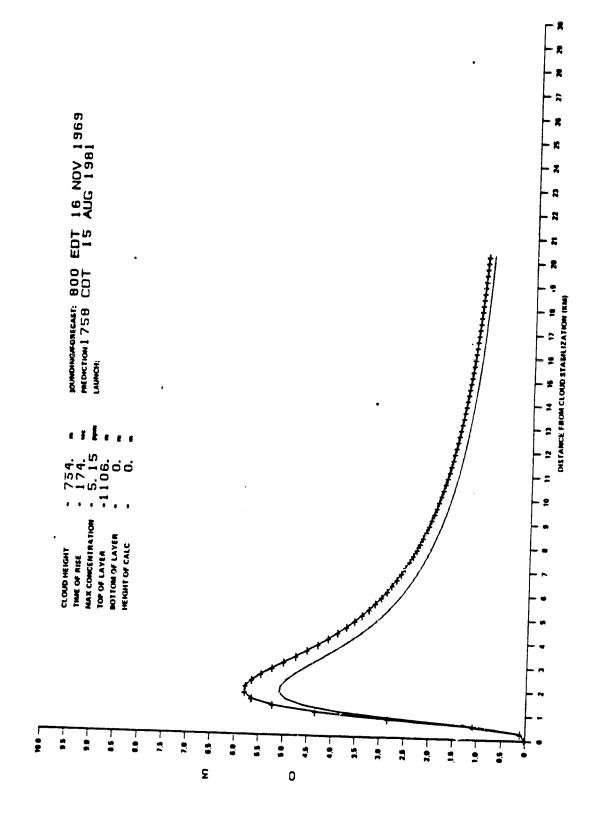


Figure 3-13. Centerline Dosage/Concentration Plots

(i

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## ORIGINAL PAGE IS OF POOR QUALITY

FRUH	AZ	<u>×</u>	5	5	~	<u>~</u>	2	~	<u>~</u>	~	2	7	<u>~</u>	2	\ <u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>	6	7	~	2	5	~	5
					J	<b>4. II. 4</b>	5111.4	4.1119	7111.4	4.1118	4.1115	A. 11.01	<b>*</b> :===	12111.4	13111.4	1.111.4	15111.4	16111.4	12111.4	10111.4	1.111.4	20111.4
LAUNCH(SEC)	FINISH	2135.	3661.	5186.	6712.	5238.	9763.	11269	12815	9+M+1	15866	17352	19917	20443	21569	23495	25626	26546	28072	29597	31123.	32649
TINE AFTER	START	-17 <b>B</b> 7	-261.	1264.	2790.	4316.	5841.	7367.	8833.	91701	775-	13470	14995	16521	18047	19572	21058	22624	24150	25675	27201	. 28727
DOSAGE	(PPN SEC)	. 057	4379.79	5859.96	5066,42	4135.67	3435.43	2931,11	2555.21	2264,59	2033,24	1844,72	1688.16	1556.07	1443.14	1345,48	1260.19	1185.07	1118.39	1058.82	1005.27	526.869
CONCENTRATION	(PFH)	<b>3</b> 90 .	3,631	5.126	4.432	3.618	3.603	2.564	2.235	1.98.1	1.779	1.614	1.477	1.361	1.262	1.177	1.102	1.637	926.	. 926	529.	.637
DISTANCE	(HETERS)	ō.0	1000.0	2600.0	3000.0	7.000 t	5000.0	6.0009	7666.6	B000.0	9000.0	1 0060.6	11006.0	12000.6	13000.0	14000.	15000.0	16000.0	17000.0	0.00081	15066.0	20000.0

CLOUD CONCENTRATIONS AND DUSHGES

\*\*\*\*POINT OF MAXIMUM CONCENTRATION\*\*\*\*
RANGE FROM PADCM3, 1861.4
DIRECTIONCDEGS, 191.6
HEIGHT(M3) 0.0
MAXIMUM CONCENTRATIONCPPM3, 5.145

\*\*\*\*POINT OF MAXIMUM DOSA/E\*\*\*\*
RANGE PROM PACKN), 1851.4
DIRECTION(DEG), 191.6
HEIGHT(N), 0.0
MAXIMUM DOSAGE (PPM SEC), 5882.0

\*\*\*\*CONCENTRATIONS AND DOSAGES WITH 10 DEGREE UNCERTAINTIES\*\*\*\*

.211 125.984 147.953 57.684 DOSAGECPPN> 2109,168 +/-7.730 +/--/+ 25.9094 5409.617 +/-3.681 +/-.066. .116 .123 . 000 CONCENTRATION(PPM) .676E-02 +/--164E+01 +/--473E+01 +/-.322E-02 +/-AZINUTHKDEG): 170.0 MATERIAL CONCENT RANGECM >1 5000.0 C02 AL203 S

Addition of Maximum Points of Concentrations and 1.195 3494.906 +/- 326.191 12.809 +/- 1.195 DOSAGECPFN> 285 . 001 CONCENTRATION(PPH) .306E+01 +/- .3 Figure 3-14. AZIMUTHODEGN: 190.0 MATERIAL CONCENT HCL

5006.0

RANGECHOL

Dosage Along Ground Track



Off-Centerline Concentration/Dosages. The user is then prompted for off-centerline concentrations/dosages. These are selected, causing a call to the ORIGIN subroutine and a further prompt for the desired pad number/map type. Of the choices listed, pad 39 was chosen, and a sea map (Figure 3-15) rather than a land map (Figure 3-16 is chosen. As will be seen, this is a mistake, as better resolution and coverage would result for a land map.

The user is then prompted for range and azimuth (pad-relative) to the point for which off-centerline calculations are desired. The prompting continues (Figure 3-17) until a zero (0) range is entered. During this time, the off-centerline effluent concentrations, their associated  $\pm 10^{\circ}$  (in azimuth) uncertainties, and dosages and their respective uncertainties, are printed on the printer (Figure 3-18). The points are also plotted on the plotter, and labeled with their ordinate index (1st one = 1, 2nd = 2, etc.) (Figure 3.19).

<u>Isopleth Plotting</u>. The user is then prompted for isopleth plotting. This is accepted and the default set of concentration levels is listed on the terminal display, and the user is asked if he intends to use these, or input his own (Figure 3-20). These are accepted, and the isopleths are drawn and (Figure 3-21) labeled.

<u>Cloud Arrival/Departure Time</u>. Finally, the cloud position and extent as a function of time are printed in a concluding table (Figure 3-22).

Termination. The user is then asked for termination ("T") or restart ("R") termination is chosen (Figure 3-20).



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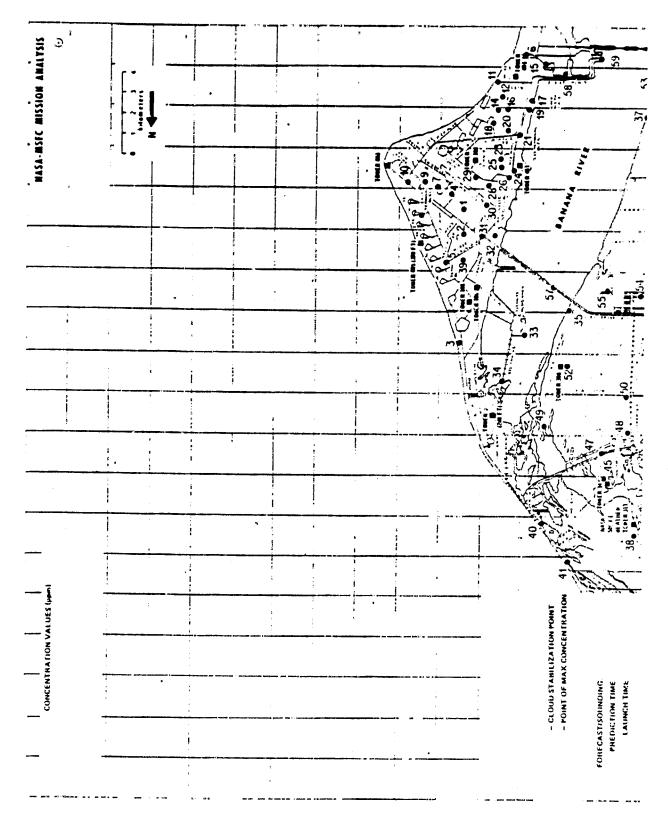
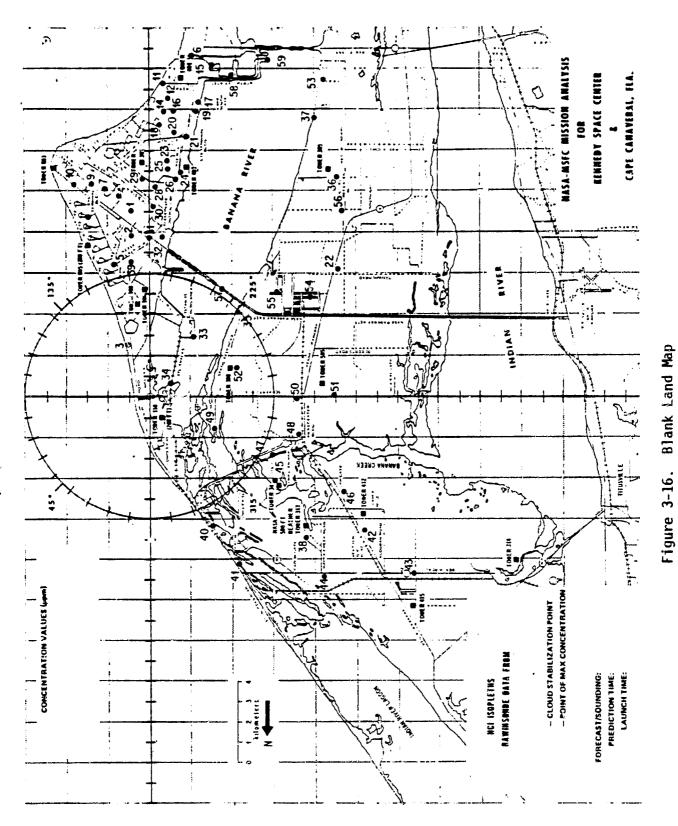


Figure 3-15. Blank Sea Map

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SI-

SPECIFIC SITE PREDICTIONS (PLOTTED)?	YES	NO
39.SEA MAP		
ENTER RANGE(M) AND AZIMUTH(DEG): (Ø TERMINATES PROCEDURE) RANGE: 1000 AZIMUTH: 192 RANGE: AZIMUTH		
ENTER RANGE(M) AND AZIMUTH(DEG): (Ø TERMINATES PROCEDURE)  RANGE: 1000 AZIMUTH: 192  RANGE: 2500 AZIMUTH: 192  RANGE: 5000 AZIMUTH: 192  RANGE: 7000 AZIMUTH: 192  RANGE: 3500 AZIMUTH: 192  RANGE: 10000 AZIMUTH: 192  RANGE: 12000 AZIMUTH: 192  RANGE: 15000 AZIMUTH: 192  RANGE: 25000 AZIMUTH: 192  RANGE: 25000 AZIMUTH: 192  RANGE: 25000 AZIMUTH: 192  RANGE: 0 AZIMUTH: 192		
RANGE: 0 AZIMUTH:		
CONCENTRATION ISOPLETH PLOT DESIRED?	YES	NO

Figure 3-17. Specific Site Range/Azimuth Entry



# \*\*\*\*CONCENTRATIONS AND DOSAGES WITH 10 DEGREE UNCERTAINTIES\*\*\*\*

RANGE(M): 5000 AZIMUTH(DEG): MATERIAL HCL CO CO2 AL203 NO		.050 .000 .110 .129 .000	DOSAGE 109.108 +/- 7.730 +/- 4606.357 +/- 5409.617 +/- 3.681 +/-	57.684 .211 125.984
RANGE(M): 5000 AZIMUTH(DEG): MATERÏAL HCL CO CO2 AL203 NO		.285 .001 .623 .732	DOSAGE 3494.906 +/- 12,809 +/- 7632.983 +/- 8964.029 +/- 6.099 +/-	326.191 1.195 712.411
RANGE(M): 7500 AZIMUTH(DEG): MATERIAL HCL CO CO2 AL203 NO		.219 .001 .478 .561 .000	DOSAGE 2428.497 +/- 8.900 +/- 5303.912 +/- 6228.813 +/- 4.238 +/-	(PPM) 250.218 .917 546.484 641.781 .437
RANGE(M): 1000 AZIMUTH(DEG): MATERIAL HCL CO CO2 AL203 NO	00.0 190.0 CONCENTRATION(PPM) .163E+01 +/- .596E-02 +/- .355E+01 +/- .417E+01 +/- .284E-02 +/-+/-	.176 .001 .385 .452	DOSAGE 1859.782 +/- 6.816 +/- 4061.821 +/- 4770.125 +/- 3.246+/-	201.469 .738 440.015
RANGE(M): 1250 AZIMUTH(DEG): MATERIAL HCL CO CO2 AL203 NO	00.0 190.0 CONCENTRATION(PPM) .132E+01 +/- .483E-02 +/- .288E+01 +/- .338E+01 +/- .230E-02 +/-+/-	.147 .001 .321 .377	DOSAGE 1506.710 +/- 5.522 +/- 3290.701 +/- 3864.536 +/- 2.630 +/-	(PPM) 168.214 .616 367.386 431.451 .294

Figure 3-18. Off-Centerline Concentrations and Dosages with  $\pm 10^{\circ}$  Uncertainties for all Effluents



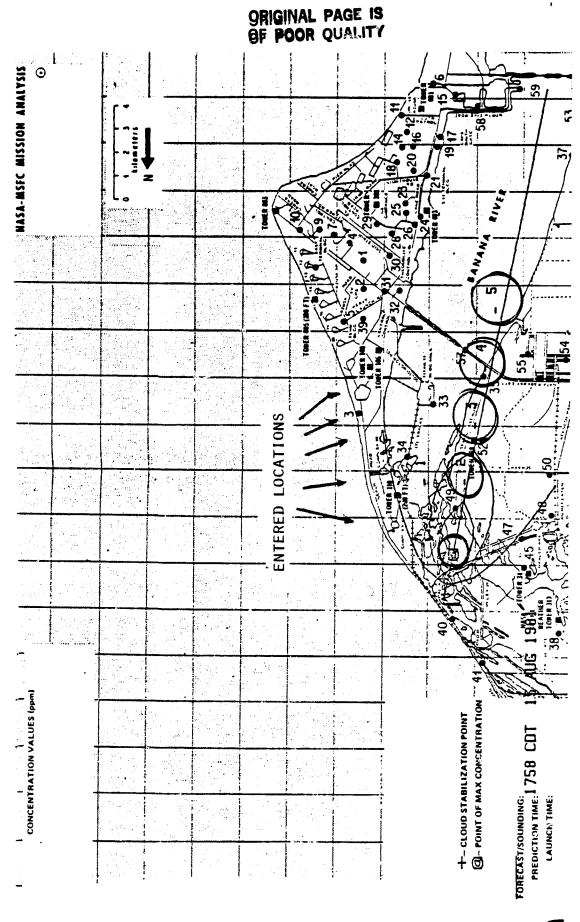


Figure 3-19. Off-Centerline Point Plotting

CONCENTRATION ISOPLETH PLOT DESIRED?

YES

NO

YES

DEFAULT ISOPLETH CONCENTRATION VALUES ARE: CONC(1) = .515 CONC(2)=2.573 CONC(3)=3.859 CONC(4)=1.0

USE DEFAULT ISOPLETH CONCENTRATION VALUES ?

YES

NO

YES

T

\*\*\*\*\* PROGRAM REEDS HAS TERMINATED NORMALLY \*\*\*\*
REEO5 : STOP 0000

Figure 3-20. Default Isopleth Values, Isopleth Plotting, and Program Termination

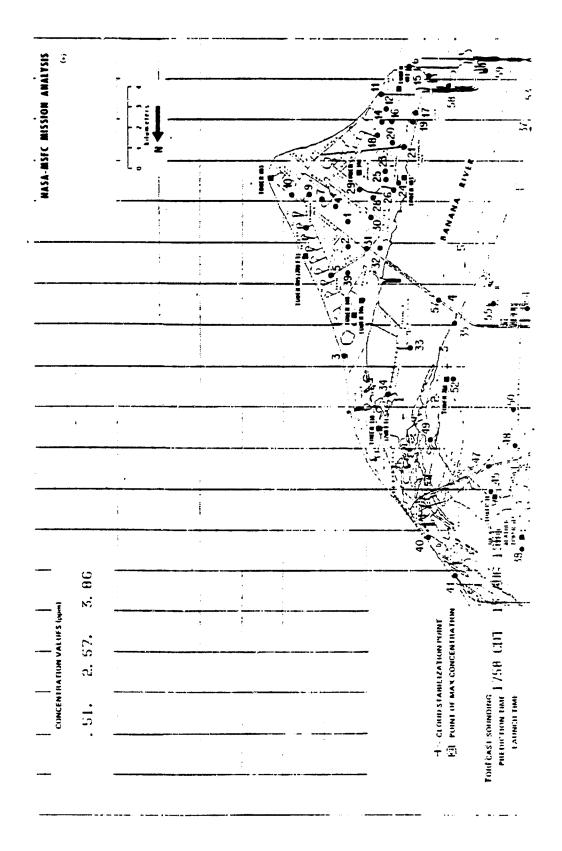


Figure 3-21. Isopleth Plotting

CLOUD LOCATION AND DIMENSIONS TIME FROM LAUNCH (SEC)	DIMENSIONS RANGE AZIMUTH (MFTFRS) (DFG)	DIAMETERS (METERS)	(METERS) ALONG WIND
		CNUSS WIND	ALUMA MIND
THE DISTANCE FROM STABILIZATION IS:	0.000		
54.0	119.8 201.3	1285.3	1285.3
THE DISTANCE FROM STABILIZATION IS:	196.63	0 1101	1001
54.0 FROM STABILIZATION IS:	304.4 180.9 393.27	0.6161	1285.6
54.0	498.3 176.1	1756.7	1286.4
THE DISTANCE FROM STABILIZATION IS:	589.90	2006 1	7 7001
FROM STABILIZATION IS:	786.53	7.0002	7.7071
54.0	889.8 172.8	2260.8	1289.5
THE DISTANCE FROM STABILIZATION 1S:	983.17		
54.0	1086.0 172.1	2519.0	1291.9
THE DISTANCE FROM STABLEICATION 15:	1282 3 171 5	2779.8	1294.7
THE DISTANCE FROM STABILIZATION IS:	1376.44		
54.0	1478.7 171.2	3042.6	1298.1
THE DISTANCE FROM STABILIZATION IS:	1573.07		
	1675.2 170.9	3306.9	1302.0
FROM STABILIZATION IS:	1769.70		,
54.0	1871.7 170.6	3572.3	1306.4
FROM STABILIZATION IS:	1966.34		
52 54.0	2068.2 170.4	3838.6	1311.3
⋖	2162.9/		
54.0	2264.8 170.3	4105.6	1316.7
THE DISTANCE FROM STABILIZATION 15:			
54.0	2461.3 1/0.2	43/3.2	1322.5

Figure 3-22. Cloud Position and Extent as a Function of Time

#### SECTION 4.0 LISTINGS

This section contains the current listings of critical elements of the REEDS system. They are included as follows:

- SECTION 4.1 Main Program Modules and Subroutines Packages
  - 4.1.1 REEDS (Executive Module)
  - 4.1.2 REEDT
  - 4.1.3 RCLDS
  - 4.1.4 RCLDT
  - 4.1.5 RMTPS
  - 4.1.6 RMTPT
  - 4.1.7 RCONS
  - 4.1.8 RCONT
  - 4.1.9 RISOS
  - 4.1.10 RISOT
- SECTION 4.2 AUXILIARY SUBROUTINE LISTINGS
  - 4.2.1 CTLB2
  - 4.2.2 MLIB2
  - 4.2.3 CALIX
  - 4.2.4 DLINE
- SECTION 4.3 MAIN MODULE QUESTION FILES
  - 4.3.1 ?REEDS
  - 4.3.2 ?RCLDS
  - 4.3.3 ?RCONS
  - 4.3.4 ?RISOS
- SECTION 4.4 EXAMPLE METEOROLOGICAL DATA FILES



#### 4.1 MAIN PROGRAM MODULES AND SUBROUTINE PACKAGES

This section contains the current listings of current Main Program Modules and the respective Main Subroutine Packages. They are listed according to the sequences indicated in Section 4.0.



COMMON ALTG30), IDIRG30), SPEEDG30), TEHPG30), PPE 55-40), PTFHF 30), SUPBEH, FILE(3) INTEGER FILE PROGRAM REEDS(3), REEDS SINGLE LAYER DIFFUSION HODEL--CABBINGES COMMON PARAMETERS COMMON YPOS, VES, ISMOFOL, IRUN, ITALC, IPLACE, ITHNEZ, IGOTAF. NUMRON, LU, NUM, NONLY, HFORH, LUPPNI, 116U, 15L1, 1FL2, 1F13 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* RCLDS, RCOMS, AND RISOS ARE LOADED AS FOLLOWS: "FRXXXS EXPERIMENTAL CONNON PI, PIOVR2, PI43, THOPI, SGR2PI, DELRAD, RADDEL, 142 STIBLE LAYER DISTRIBUTION TECHNIQUE AREEDS 1=06003 IS ON CROOOCS USING UNISO BLKS Revenu COMBON TIME, IDAY, INCHINE 23, 17548 RMTPS IS LOADED AS FOLLOWS: NATH PROGRAM -- REEDS MASAZNSFC REED Code COHNON VPAR 18), SIGHEL LOADING INSTRUCTIONS: BULL BULL OF STATE MATH PARAMETERS MERGE XLINE MERGE XDLINE MERGE XCALIX MERGE XCTLB2 EMD CONNON AREAS HERGE ZRXXXT HERGE KRNTPT HERGE KPLINE HERGE XCALIX HERGE XMLIB2 LOAD ZRHIPS MET DATA INTEGER YES 1000 REEDS, FTEEN, L ? ? ? **₹** 0053 0055 66948 1000 0003 6003 9000 0035 8200 6200 8628 0037 002 4-3

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COMMON STBALT, STBHT, STBAZD, STBRMG, STBTIM, CLORAD, RISTIM(30), BOTLAY.
Toplay, Calht, Laytop, Laybot, Reflec, IPT2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "MODEL"3X"21 DEC 1979 ",1041H+>Z1X,1043H+>,66X,1641H+>Z
1X,1041H+>,60X,1041H+>Z1X,1041H+>,27X"REEDS "22X,1041H+>Z
                                                                                                                                                                                                  DIFFUSION COEFFICIENTS
COMMON SIGXO, SIGZO, SIGAP, XDIST, YDIST, EXPZ, SOSIGZ, SIGY, SIGAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C*OPPEDICTION TIME: "14" C*A2,4X"DATE: "12,1302,A1,13142
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                                                                       CONNON LITHE, LTIN, LOAY, L'SONTHC2), LYEAR, LAUNTD(10)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         .37500, 1479.7, 1062.35, 1000., .1146, .00042, .25879, 19259,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          .29653, 1479.7, 1062.35, 1000., .1146, .00042, .25029, .18279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DATA VPAKS/9.478590909E6,3.84505682E6,9.887260711E5,1.251174E9,
5.075475E8,1.015695E9,.652213,.468035,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (2MI2.17,2X15.7MI3.5MF4.1,4MF4.1,4MF5.2,6MF4.1,6MF5.2)
(*****OPEN OR IDRPL IERR: "13", JOB TERMINATED*****
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DATA VPARSZI.3454EZ, 6.882968E6, 9.88726ATHE5, I.894794173E9, IATA VPARSZI.5219E7, 6.882968E6, 9.88726ATHE5, I.251174E9, 8.569295E9, 1.713859E9, 165213, 1468A5,
                                      ("0"5X"TIME: "14,1XA1,A2,4X"DHTE: "12,1XA2,A1,1X14)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FO, SDT, TE, ZERGG, ZEPOT, RCLDR(3), HAMRP(3, S)
DIMENSION IPAR(5), VPARS(18, 5), TDCB(272), IRUF(40), INLT(30),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YALUES CONSISTENT WITH SAT REVISION OF SS E15---2/22/78 OCI, OTI AZE VALUES FOR NORMAL LAUNCH SEQUENCE OC2, OT2 ARE VALUES FOR ONE SRN BURNING ON LAUNCH PAD OC3, OT3 ARE VALUES FOR BOTH SRNS EXPLOPING ON LAUNCH PAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           5.43752866,2.71876466,1.35439266,3.36251-360,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              1.6312594E8, 3.2625169E8, .429594474, .519123, 5.0.2821, 1.1416, 52, .4444, 1.1732, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4475, .4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTEGER BLANKS, RCHAR, TCHAR, SCHAR, VHAMESC 4, 3), RUNGHUM, RA,
                                                                                                                                                                                                                                                                                                                                                                             TERP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (73 - 90) = HINUTERAN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CC IS HOLD DOWN TINE ON LAIMEN PAP FOR HORMAL LAIMEN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VALUES ARE CONSISTENT WITH THIOKOL YAB SAFETY STUDY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FORMAT ("***** TORPD IERR: "13", JOB TERMINATED****)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (19 - 36) = TITAH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               5.075475E8,1.015095E9,.652213,.488495,
                                                                                                                                                                                                                                                                                                                                                                                                                                                          HO. (FEET) (NETERS) (DEGREES) (H/SEC)
                                                                                                                                                                                                                                                                                                                                                                                SPEED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (MILLIBARS)")
                                                                                                                                                                                                    4.7.7"0"80(1HS)71X, 20(1HS), 40X, 20(1HS).
1X,20(1HS), 16X"SUUHD ING"16X, 20(1HS).
                                                                                                                                                       1X, 204 HS ), 40X, 204 1HS ), 1X, 804 1HS 5,773
                                                                                                                                                                                                                                                                                                                               ("DSURFACE DENSITY (GH/M++3), "FB,2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     BURN TIME IS 7.7.78 TIMES NORMAL BURN TIME
                                                                                                                                                                                                                                                                                                                                                                      PIRECTION
                                                                                                                                                                                                                                                                                                                                                                                                         "POI-TENP D P TENP PRESSURE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DP TEMP(30), HAME(3), HAMEF(3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TYPE AND DINGNSTON STATEMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    "< DEGREES CENTICRADE >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (55 - 72) = DELTA 3914
                                                                                                                                                                                                                                                                                                                                                                         ALTITUDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VPARSCI THRU 18) = SHUTTLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CATA HAMFE,/2H7R, 2HEE, 2HDS/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DATA NAME/2H=R,2HEE,2HD2/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          . 00619, .64,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 . 00020, .64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DATA STATEMENTS
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   (6X,48A2)
                                                                                                                                                                                                                                                                                                                                                                  210 FORMAT ("BLAYER
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    212 FORMAT CLE FORMAT CLE FORMAT
                                                                             207 FORMAT
205 FORMAT
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                                      266 FURNAT
                                                                                                                                                                                                    208 FORMAT
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IF ERRORS ENCOUNTERED, WPITE OUT AN ERROR
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                                                                                                                                                                                                                                                                                                                                                                               SET THE LOGICAL UNIT HUMBERS OF THE DEVICES TO BE USED FOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             End blashastipe willy tall that he mitthelest to get compe
                                                                                         9.396416E6,4.69930BE7,1.245756,.4168947,
0.0.1449.9,1000.0,411.10,.1866,.2055,.0156,.3391,
0.0.1449.9,1000.0,411.10,.1589,.0331,.2783,.1936,
                 3,14229E6,1,883373E7,922156,432783,54,1766,6,
1000.0,690.0,1866,2655,0156,3331,6602,
1000.0,690.0,1218,0156,2055,2214,6662,
                                                                                                                                                                                                                                             DATA BLAHKS/2H /, RCHAR/IHR/, TCHAR/IHI/, SCHAR/IHS/, RA/2HRA/, FO/2HFG/, SDT/2HDT/, TE/2HTE/, ZEROO/30660B/, ZEROI/034471B/, RCLDR/2HRC,2HLD,1HS/DAT/, ZHUT,2HTL,1HE,
                                                                                                                                      .0002,.50,
4.684476E5,4.684476E5,1.171119E5,2.8106356E7,
2.6106356E7,2.8106656E7,.469382,.463333,0.0,
2555.9,2055.9,1000.0,.1866,.2655,.0156,.3391,
2055.9,2655.9,1000.0,.1866,.0156,.2055,.3391,
                                                                                                                                                                                                                                                                                                     2NTI,2NTA,1NH,1N ,
2HDE,2HLT,1NA,1N ,
DATA HAMRP/2HRC,2HLD,2HS ,2HRN,2HTP,2HS ,2HRC,2HON,2HS 2HRI,2HS /
  .360ë85ES,9.09011E4,2.729434E5,2.887598E7,
                                                                          1.057557E6,1.482923E5,3.70731E5,6.70269E7,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALL OPERCINCB, LERR, HAMPPOLL 13, 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL IDEFLCIDED, IERR, HAHFPCI, I)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MESSAGE AND TERMINATE REEDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FCLUPRHT LE. OXLUPRHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF( IFL2.LE. 0) IPL2 = 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FRIPLILE, 0) IPLE = 12
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                                                                                                                                                                                                                                                                                                                                                                                                                                                        LU - MAXOCIPARCID, 13
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VRITE (LU, 212) IERP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RP ALL SEGNENTS
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                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL RMPARCIPARS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DO 1 Int, HUMSEG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IPL2 = IPAR(4)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IFL3 - IPAR(S)
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DECIDE ON THE TYPE OF CLOUD RISE DESIRED...HEW CURVE FIT OR OLD PROCEDURE
WRITEC1,777)
FORMATC" DO YOU WANT THE LOW ALT CHRVE FIT? YES HIS
REAKC1,776) TANS
FORMATCA1,"") BEGIN PROCESSING OF HEW DATA BY CLEAPING SCOPE WRITE (IDATAF, 187) LDAY, LMOHIH, LYENP CALL CHAR(368.0, YPOS, 0, IVATAF, 11,2,0) YPOS = YFOS - 32.0 INITIALIZE SOME COMMUN VARIABLES CALL LERSKYPOS, LVERSHY)
CALL CHARK 0.0, YPOS, 0, ILLINE, 64, 0.0)
CALL GETTN(LTIM, LDAY, LHONTM, LYEAR) WRITE THE HEADER ON THE CONSOLE IX = 25 JFC LANS .HE. 1H72 GO TO 771 DREADCHAHEF, 2, ILINE GRAF FOR CRTS LTINE = .FALSE. CALL GRAFOLD 2 CALL CLEAR CALL CODE YES = 1HY IPLACE # 1TIMEZ # 1GOTMP # LAYBOT # BOTLAY # IF17 = 1 10 = 13K P143 = ISHDFO IVHICL IRUN -ICALC -REFLEC DECRAC PIOVR2 SORZPI RAPPEG CALHT THOP CB Je 1 e <u>.</u> 226 777 ۲ ۲ ပပပ 0250 0251 0252 0253 0254 0249 0282 6583 0286 0289 0293 0294 0295 9296 0297 0297 1970 1584 0291 0292

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OTHERWISE RESPOND WITH Y FOR YES, N FOR NO TO ANSWER GUESTIONS ** A "O" FOR ALMOST ANY ENTRY WILL PERMIT INNEDIATE TERMINATION
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CALL IN(0, JTYPE, 175.6, YPOS, 0, IDATAF.HIH, 6, 31.0, 31, EX, EY, CALL CHAR(0, 0, YPOS, 0, ILINE, 22, 0, 0)
YPOS = YPOS - 32.0
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                                                                                                            READ IN THE 1ST 4 CHAR'S OF THE DATA FILE NAMES
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IFCIX .LE. 25)CALL CHAR(464.0,YPOS,0,IEPS,6,0,0)
IFCIX .GT. 25)CALL CHAR(384.0,YPOS,0,IERS,8,0,0)
YPOS = YPOS - 32.0
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                            URITEC1,773)
FORMAT(" LGW ALTITUDE CURVE F37",30X," HG")
                                                                                                                                                                                       CALL CHAR(384.0, YPOS.0, ILINE(25), 8,3,0)
CALL CHAR(464.0, YPOS.0, ILINE(30),6,0,0)
                                                                                                                                       CALL DREAD(HAMEF, 3, ILINE)
CALL LERS(YPOS, LVERSH)
CALL CHAR(0,0,YPOS,0,ILINE,43,3,0)
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CALL LERSCYPOS, LVERSH)
CALL CHRK 6.6, YPOS, 6, ILINE, 22, 3, 6)
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1F(1AHS .NE. HO) GQ TQ
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                                                                                           YPOS = YPOS - 32.0
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CHECK FOR PLASMASCAPE....

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JECLVERSHINGO TO 10

AND PLOTTING ALLOWED) OR PROPUCTION RUNS

DPEADCHAMEF, 7, IL. THES

CALL LERS (YPOS, LVERSH)

CALL CHARCO.O, YPGS, O, ILINE, 12, 3, 0) CALL CHARCO.O, YFGS, O, ILINEC?), 19, 0, 0) CALL CHARC240.O, YPGS, O, ILINEC160, 14, 3, 0) CALL CHARC352.9, YPGS, O, ILINEC230, 18, 0, 0)

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CBJ*** IF THIS IS A SPECIFIC SOUNDING RUN, SOUMPING CODE UILL BE SET=1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    FIND OUT IF THESE RUIS ARE TO BE RESEARCH RUNS CINTERACTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8 READCIDATAF, 111) IDAYCCHSPEC), INDNGCHSPEC, 1), INDNGCHSPEC, 2),
. ITINGCHTPEC)
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                                                                                                                                                                                                                                              ACCORDING TO PLACE, TIME ZONE CODE WILL BE ENCODED
                                                                                                                                                                   .AND. FILE(2).EQ.2HPE)IPLACE
.AMD. FILE(2).EQ.2HTA)IPLACE
.AMD. FILE(2).EQ.2HEC)IPLACE
                                                                                                                                                     AND. FILE(2), ED. 2HHD ) IPLACE
                                                                                                                CBJ+++ DECODE LOCATION FROM DATA FILE HAME
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CALL CHARCO, YMPOS, 0, ILINE, 46, 0,0)
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HSPEC+1, HUMRUH
= YPOS - 16.
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CALL LERSCYPOS, LVERSH)
CALL CHARCO., YPOS, 0, ILINE, 20, 0, 0)
CALL BLANK(IDATAF, 10)
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CALL LERS(YPO3, LVERSH)
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IFCIPLACE .EQ. 2)REWIND
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IFCFILE(1).E9.2HTA
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IFCFILECTO.ED. 241SP
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FOR PRODUCTION KUNS, READ IN THE TOP OF THE GURFACE LAYER AND THE SIGMA OF THE WIND AZIMUTH ANGLE TO BE USED FOR ALL RUHS
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IF(IX.GE.12 .AND. IX.LT.19)CALL CHAR(368.0,YPOS,0,IERS,16,0,0)
IF(IX .GE. 19)CALL CH.X(120.0,YPOS,0,IERS,30,0,0)
                                                                                                                                                                                                                                             IFC IX.GE.12 .AHD. 1X.LT.19)CALL CHARCI20.0, YPOS, 0, IERS, 16, 8,8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INK 0, JTYPE, 263.0, YPGS, 0, IDATAF, HIN, 0, 31, 0, 31, IX, IY)
CHARK 0.0, YPGS, 0, ILINE, 33, 0, 0)
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                                                                                                                                                                                                CALL CHAR(0.0,YPOS,0,ILINE,64,0,0)
IF(IX .LT. 12)CHLL CHAR(240.0,YPOS,0,IERS,32,0,0)
                                                                         FC CLANS.NE.1HR) .AND. CLANS.ME.HHP) ) GO TO 11
                                                                                                                                                                     CALL INC. JIYPE, 0.0, 0.0, 0, 0, 0, 31, 0, 31, 1X, 1Y)
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SIMB ARCHG472, 0, YPGS, 0, ILINEC30, 4, 3, 0)
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CALL LERSCYPOS, LVERSH)
CALL CHAR(0.0, YPOS,0, ILINE, 43,3,0)
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IF(HIN .EG, 1)ISIGAZ = ISIGAZ/10
SIGAZ * FLOAT(ISIGAZ)
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                                                                                                        .NE. 1HP >GO TO 11
                                                                                                                                    IF CIANS .EQ. 1HP >GO TO 11
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                                                                                                                                                                                                                                                                                                                                         IF 1RUH .LE. 23G0 TO 12
                                                            IF CIAHS. EQ. 140 >GO TO 81
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                                                                                                                                                                                                                                IF(IX .LT. 12)IRUN = 1
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OTHERWISE RESPOND WITH Y FOR YES, N FOR NO TO AUSUER QUESTIONS
                        OTHERNISE RESPOND WITH Y FOR YES, IL FOR HO TO ANSWER MUESTIONS
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IFCIX .LE. 25)CALL CHAP(464.0,YPOS,0,IFPS,6,n,0)
IFCIX .GT. 25)CALL CHAP/394.n,YPOS,0,IEPS,3,6,0)
                                                                                                                                                                                                                                                CALL CHAR(0,0,YPOS,0,ILIME,64,0,0)

FFGW LE. 25)CALL CHAR(472,0,YPOS,0,IER9,5,0,0)

FFGW GI. 25)CALL CHAR(400.0,YPOS,0,IER9,4,0,0)

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CALL LERS(YPOS, LVERSH)
CALL CHAR(0.0, YPOS, 0, ILINE, 17, 3, 0)
CALL CHAR(384.0, YPOS, 0, ILINE(25), 8, 3, 0)
CALL CHAR(464.0, YPOS, 0, ILINE(30), 6, 0, 0)
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JFCLVERSHIGG TO 13
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JF(1X .LE. 25)CALL CHAR(464.0,YPGS,0,IERS,6,0.0)

JF(1X .GT. 25)CALL CHAR(384.0,YPOS,0,IERS,8,0,0)

JF(1X .GT. 25)LUPRNT = 64
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Call. Char(224, 0, ypos, 0, idataf, 20, 0, 0)
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                                                                                                                              PLASMASCOPE VERSION, SKIP TO THE CALL TO "IN"
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CALL CHARGO. 0. YPOS, 0. ILINE, 28, 3, 0)
CALL CHARGO. 0. YPOS, 0. ILINE(25), 8, 3, 0)
CALL CHARGO. 0. YPOS, 0. ILINE(25), 8, 3, 0)
CALL CHARGO. 0. YPOS, 0. 3LINE(30), 6, 0, 0)
CALL GETTO
                           CALL DREAD(HAMEF, 25, ILIME)
CALL CHARK 0.0, YPGS, 0, ILIME, 26, 3, 0)
CALL CHARK 354.0, YPGS, 0, ILIME, 25, 3, 0)
CALL CHARK 354.0, YPGS, 0, ILIME(25), 8, 3, 0)
CALL CHARK 454.0, YPGS, 0, ILIME(25), 6, 0)
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CENERATE PRINTER OUTPUT?
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OTHERNISE RESPOND WITH D FOR DELTA, I FOR TITAN, OR S FOR SHUTLE
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                                                                                                                                                                                                                                                                                                                                                                               CALL IN(0, JTYPE, 207.0, VPOS, 0, IDATAF, NIH, 0, 31, 0, 31, 1X, 1Y)
CALL CHAR(0.0, VPOS, 0, ILINE, 26, 0, 0)
                                                                                                                                                                  CALL CHAR(0.0,YPOS,0,ILIME,28,0,0)
CALL CHAR(384.0,YPOS,0,ILIME(25),15,0,0)
IF(ix .LE. 25)CALL CHAR(464.0,YFOS,0,IERS,6,0,0)
IF(ix .GT. 25)CALL CHAR(384.0,YPOS,0,IERS,8,0,0)
YPOS = YPOS = 32.0
IF(ix .LE. 25)GO TO 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ET & O ANSWER (BLAIK) DEFAULT TO THE TITCH IFC (TANS.ME.146) J.X = 20 IFC (TANS.ME.140) AND. CIAUS.ME.111) J.X = 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL THCC, 5, 875, 8, 9, 9, 6, 6, 6, 9, 31, 9, 31, 8, 17, 18, 17
                                                                                                                                  CALL IIKI, JTYPE, 0.0,0.0,0,0,0,0,31,0,31,1X,1Y)
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YPO9 = YPOS - 32.0
IF(LAUNTD(1), EQ. BLANKS)GO TO 20
LTIME = .TRUE,
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IFCIANS.EQ. THR SGO TO BE
                                                       IF( JAHS. NE. NO) GO TO 22
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                                                                                                                                                                                                                                                                                                       CALL LERSCYPOS. LVERSH)
                   THIS IS THE "HO" RESPONSE
                                                                                                                                                                                                                                                                                                                                                             CALL BLANKCIDATAF, 18)
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Carress IF IVHICL = 0 THEN IT IS A SHUTTLE LAURCH.
                                                                                                                                                                                                                                        Correspondences of the II is a DELTA LAUREN.
                                                                                                                                                          CO+++THE NEXT FEW PAGES OF CODE WERE ORIGINALLY CONNEHTED OUT AT THE CO+++DIRECTION OF DR. STEPHENS..BUT ARE TEMPGRARILLY RESTORED..CABRIDE25
IF(IX .LE. 15)CALL CHAK(312.0, YPOS, 6, IERS, 24, 0, 0)
IF(IX.GT.15 .AHD. IX.LT.24)CALL CHAR(192.0, YPOS, 6, IERS, 12, 0, 0)
IF(IX.GT.15 .AHD. IX.LT.24)CALL CHAR(16.6, YPOS, 0, IERS, 11, 6, 0)
IF(IX.GE. 24)CALL CHAR(592.0, YFOS, 0, IERS, 24, 6, 0)
YPOS = YPOS - 32.0
IF(IX.LE. 15)GO TO 25
IF(IX.LE. 23)GO TO 24
                                                                                                                                                                                                                                                  IF IVHICL . I THEN IT IS A TITAN LAUNCH.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SHANGE IN BOTTON LAYER WITH TOTAL REFLECTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL 1H(1, JTYPE, 0.0, 0.0, 0, 0, 0, 0, 31, 0, 31, 1%, 1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL DREADCHAMEF, 16, ILINE)
CALL LERSCYPOS, LVERSH)
CALL CHAR(32.0, YFOS, 0, ILINE(3), 11,3,0)
CALL CHAR(160.0, YFOS, 0, ILINE(11), 43,6,0)
IF(LVERSH) GO TO 291
READCLU, 91) IAHS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CHAR(0.0, YPOS, 0, 31.1NE, 64, 0.0)
= YPOS - 16.0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (COMMENTED-OUT)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CALL DREAD(HAMEF, 15, ILINE)
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IFCIANS .EQ. 2NSE) IX = 25
GO TO 293
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LERSCYPOS, LYERSH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                            FILL THE VPAR SARAY
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INC 0, JTYPE, 129. 6, YFOS, 0, JUATAF, HIN, 0, 31, 0, 31, 1X, 1Y)
                -- SOMETHING ELSE
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.LE. 25)Chl CHAR:464.0,YPO5,0,1FPS,6,0,0)
.LE. 25:60 TO 34
                                                                                                                                                                                                                                                                                                                                                   CALL 11K1, JIYPE, 0.0, 0.0, 0.0, 0.31, 0.31, 1X, 1Y)
CALL CHAR(0.0, YPOS, 0.1EKS, 42, 0.0)
CALL CHAR(0.0, YPOS, 0.11.1HE, 42, 0.0)
IF(IX 'LE, 25)GO TO 37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL CHARCES, 0, YPOS, 0, ILINE, 45, 3, 0)
CALL CHARCES, 0, YPOS, 0, ILINEC25), 8, 3, 0)
CALL CHARCES, 0, YPOS, 0, ILINEC25), 8, 3, 0)
CALL HK I, JYYPE, 0, 0, 0, 0, 0, 0, 0, 0, 31, 0, 31, 17, 17
CALL CHARCES, 0, YPOS, 0, ILINE, 64, 0, 0)
                                                                                                                                                                                                                                                                                                                        CALL CHAR(384.6, YPOS. 0, ILINE(25), 8, 3, 0)
CALL CHAR(464.0, YPOS, 0, ILINE(30), 6, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CHARC 47. 0, YPOS, 0, ILINEC 4), 16.3, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL CHAR(4.4, YPOS, 4, 1ERS, 16, 4, 4)
CALL CHAR(47.4, YPOS, 4, ILINE(4), 14, 6, 0)
YPOS = YPOS = 32.4
                                                                                                                                CALL CHARCTED. P. YP, D, ILLHECTT), 16, 0, 0)
                                                                                                                                                                                                                                                              CALL CHARC320.0,YP.0,ILINEC20),18,0,0)
Call Dreadchamef,17,1Line)
                STABLE 12ATION
                                                                                                                                                                                                                      DEFAILT HEIGHT OF CALCULATION, 22?
                                                                                                                                                                                                                                                                                                            CALL CHAR( 6.8, YPGS, 0, 1LINE, 42, 3, 0)
                                                                                                                                                                                                                                                                                                                                                                                                              COLL CHAR(384.0,YF09.0,1ERS,8,0,0)
VP09 = YP0S - 32.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALL CHARC394.0, YPGS, 0, 1ERS, 9, 5, 0)
                                                                        CALL CHAR( 0.0, YP, 0, ILINE, 16, 0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                         ENTER HEIGHT OF CALCULATION,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ENTER SURFACE REFLECTION?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL DREAD(HAMEF, 18, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CALL DREAD (HAMEF, 19, ILINE)
              CHECK FOR SURFACE --
                                                                                                                                                                                                                                                                                             CALL LERBY YPOS, LVERSH)
                                                                                                   .GT. 203G0 TO 30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CALL BLAHK IDATAF, 18)
CALL INCO, JTYPE, 129.6,
                                          IFC1% .GE. 8060 10 29
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                                                                                                                                                           BOTLAY - ALTCLAYBOT)
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CALL BLAHK(IDATAF, 10)
CALL IH(2, JTYFE, 440, 0, YFGS, 0, IDATAF, NIH, 6,31, 0,31, IK, IY)
IF(JTYPE . HE. 0)GD TO 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COLE. INCO, JYPE, 144.0, YPOS. 0, IDAYAF, HIH. 0, 31, 0, 31, 12, 1Y)
CALL. CODECHIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL 11K1, NYPE, 0. 0, 0. 0, 0, 0, 31, 0, 31, 1X, 1Y, CALL CHAK(0.0, YPOS, 9, ILINE, 64, 0, 0)

FF IX .LE. 25)CALL CHAR(464.0, YPOS, 0, IERS, 6, 0, 0)

FF IX .LE. 25)GO TO 36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALL CHAR(384.0, YPOS, 0, ILINE(25), 8,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL CHAR 464.0, YPOS, 0, ILINE (30), 6, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL LEKS(YPOS,1.VERSH)
CALL CHAR(47.0,YPOS,0,ILINE(4),10,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PEAD (IDATAF,*) EGILAY
(ALL GKARC47.0,YPGS,0,ILINEC4),10,0,0
CBJF++THIS SECTION HAS BEEN FLACE BELOW AT
                           WRITE OUT RE VALUES FOR SELECTION
                                                                                                                                                                                                                                                                                                                                                        CALL CHAR(48.0,YPOS,0,HLHE,6.0,0)
CALL CHAR(88.0,YPOS,0,HDATAF,4,0,0)
IFCJIYPE .NE. 0)GO TO 34
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CHLL CHGR(384.0, YPOS, 0, IERS, 8, 0, 0)
YPOS = YPOS - 32.0
                                                                                    CALL CHAR(0.0, YPGS,0, ILINE,64,3,3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CHARCO. 0, YPGS, 0, ILINE, 46, 3, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                               DEFAULT HEIGHT OF BASE LAYER?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ENTER HEIGHT OF BASE LAYER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DREAD (HAMEF, 21, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL DREADCHANEF, 22, ILINE)
                                                          CALL PREAD(HAMEF, 20, ILINE)
                                                                                                                                                                                                                                                                                                                               URITE ( IDATAF, 110) REFLEC
                                                                                                                                                                                                                                                                                     9)REFLEC = 0.
                                                                                                                                                                             READ (IDATAF,+) REFLEC
                                                                         CALL LERSCYPOS,LVERSH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CAEL BLANKCIDATAF, 19)
                                                                                                                                                                                                                                                     SYREFLEC
                                                                                                                                                          CALL CODECHINS
                                                                                                                                                                                                                                                                                                                                                                                                     CALL CODE( 4)
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                                                                                                                                                                                                                                                                                                                 CALL CODE
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CALL 1H(2, JTYPE, 440,0, YPOS, 0, IDATAF, HIH, 0,31,0,31,1X,1Y)
1F(JTYPE .HE. 9)GO TO 31
CALL CODE(HIM)
READ (IDATAF,+) REFLEC
                                                                                                                                                                                                                                                                                                                 IF(IX .LE. 25)REFLEC = 1.0
IF(IX .LE. 25)GAL GHRR(464.0, VFOS,0, IERS,6,0,0)
IF(IX ,LE, 25)GO TO 34
                                                                                                                                                                                                                                                                     CALL CHAR(472.0,YPOS,0,ILIME(30),6,0,0)
CALL IN(1,JYPE,0.0,0.0,0,0,0,0,31,0,31,1X,1Y)
CALL CHAR(0.0,YPOS,0,ILIME,64,0,0)
                                           CBJ+++ THIS IS THE END OF THE COMMENTED-OUT SECTION
                                                                                                       COJ*** INSERTED SECTION ON SUPFACE LAYER PEFLECTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ESS UP THE FILE HAUF FOR THIS PLAN SET NOW METTY OUT THE HESTER
                                                                                                                                                                                                                                                      CALL CHAR(363. 0, YPOS. 0, IL INE(25), 8,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                        WRITE OUT RE VALUES FOR SELECTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALL CHARGO.6, VPGS.6, IEES, 64, 6, 0)
CALL CHARGO.0, VPGS.0, ILINE, 6, 0, 0)
CALL CHARGO.0, VPGS.0, ICAIAF, 4, 0, 0)
27 CALL CHARCO, 0, YPGS, 0, 1EFS, 64, 0, 0)
CALL CHARCO, 0, YPGS, 0, ILINE, 53, 0, 0)
                                                                                                                                                                                                                                                                                                                                                             CHAR(384.0, YPOS, 0, IERB, 8, 0, 5)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL CHARCO. 8, YPOS, 0, ILINE, 64,3,0)
                                                                                                                                                                                                                                          CALL CHAPK 0,0, YPOS, 0, ILINE, 45,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DO LOOF ON THE FUR WITHER
                                                                                                                                                                              ENTER SURFACE REFLECTION?
                                                                                                                                                                                                           DREAD(HAMEF, 19, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL PREADCHAMEF, 20, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IFCIX .EQ. 11)REFLEC = 0.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               URITE AIDATAF, II ON REFLEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .EQ. 7)REFLEC * 0.3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IFC JTYPE . HE. 6160 TO 34
                                                                                                                                                                                                                            CALL LERS (YPOS, LVERSN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALL LERS(YPOS, LVERSH)
                                                                                                                                  1F(1RUH.HE.1 GO TO 34
YPOS = YFOS - 32.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL BLAHK IDATAF, 18>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 79 FURRIME L'HUMFUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FC IX . EQ. INREFLEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       .EO. 3)REFLEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .EO. SOREFLEC
                          YP05 = YP05 - 32.0
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IFCIPLACE .NE. 2 .AND. IPLACE .NE. 4) GO TO 39
CALL KSG65(IBUF,IALT,DPTEMP.IFOFFI,IEOF,ITING,IDAYG,INONG,ISNDG,
Runnam)
                                                                                      URITE (LUPRN),200) RUHHUH,(FILE(3),3=1,3),(VHAHES(3,1),3=1,4)
IF(LTIME)URITE (LUPRHT,201) LTIM,LAUHTG(3),LAUHTD(4),LDAY,
LHGHIM(1),LHGHTH(2),LYEAR
URITE (LUPRHT,202) ITIME,LAUHTD(4),1DAY, IHGHTH,1YEAR
                                                                                                                                                                       IF THE DATA IS ON A DISK FILE, READ FROM DISK -- IF IT
IS ON TAPE, READ IT AS KSC 1965 DATA IN SUBROUTINE KSC65
                                                                                                                                                                                                                                                                                                                                                                                                                                                             READ THE HEADINGS FROM THE DATA FILE, SETTING UP THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             READ (IBUF, 104) ISTINE, ISDAY, ISHOHELD, ISHOHEZD, ISYENP
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CALL READF(IDCB,IERR,IBUF,40,LEH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MASSTE (LUPRHT, 205) (188F(1), 1-1, LEN)
                                         CALL B22(J,FILE(3))
CALL GETTO(171ME, IDAY, INCAIN, IYEAR)
                                                                                                                                                                                                                                                                                                                                                                                CALL OPEK(IDCB, IERR, FILE, 0, 0, 0, 272)
IF(IERR, GE, 0)GO TO 40
WRITE (LUPRNT, 203) IERR
GO TO 79
                                                                                                                                                                                                                                                                                                                                                    OPEN THE DATA FILE FOR THIS RUN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   READ THE SOUNDING/FORECAST TIME
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IF(IERR. GE. 0)GO TO 42
WRITE (LUPRNT, 204) IERR
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TECIDIALE FO LITTINE = TOTIME
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IFCIEOF .EQ. 23GO TO 79
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- PUNNUM + 1FOFF
                            URITE ( J, 109 ) 1
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READ (18UF,165) [ALT(1), IDIR(1), SPEED(1), TEMP(1), PPTEMP(1), PRES9(1), SUPDEN IF(1ALT(1), LT, 10)GO TO 45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     READ (18UF, 105) IALT(1), IDIR(1), SPEED(1), TEMP(1), DPTEMP(1),
                                                                                                                                                                                                                  URITE (LUPRIT, 206) ISTINE, ITINEZ, LAMINTOCA), ISDAY, ISNUACE),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TRY TO FIND A TOTAL OF 30 DATA POINTS WITH ALTITUDES BETWEEN 20 FT AND 10,000 FT INCLUSIVE
                                                                                                                                                                                                                                                                  FIND THE FIRST DATA POINT WITH AN ALTITUDE OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ZERO OUT THE REMAINING ELEMENIS OF THE ARRAYS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IFCIALT(1).LT.20 .0%. IALT(1).GT.1000050 TO 46
|FCLAUNIDG4) .UE, 2HST)|STINE = |STINE + 10m
|FCISTIKE .GT, 0+G0 TO 44
|STINE = 2480 + |STINE
|SD9V = |SBRY - 1
                                                                                    URSTE OUT THE NEXT LINE OF THE NEWBER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL READF(IDCB,IERR,IRUF,40,LEN)
IFCIERR,LT.0 .AMD. IERP.HE.-123G0 10 41
IFCLEN .EQ. -13G0 10 48
                                                                                                                                                                                   WRITE OUT THE SOUMDING/FORECAST TIME
                                                                                                                                                                                                                                                                                                                                                  CALL 822(180F, J)
IF(J.LT.ZEROB .OR, J.GT.ZERO!)GO TO 45
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL BESCIBUE, J)
IFCJ.LT.ZEROB .OR. J.GT.ZEKOPJGO TO 46
CALL CODEC2+LEN)
                                                                                                                                                URITE (LUPENT, 205) (IBUF(1), 1=1, LEH)
                                                                                                                   CALL READF(IDCB, IERR, IBUF, 40, LEN)
IF(IERR, LT. 0)GO TO 41
                                                                                                                                                                                                                                                                                                                    CALL READF(IDCB, IERR, IBUF, 40, LEN)
IF(IERR .LT. 0)Gn TO 41
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of 1613 = 0 3048 + Fr to 1610 16133
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EO 49 I=NIMI,30
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62 PIEMP(1) = (TEMP(1) + 273.16) + (<1000.0/PRESS(1))++0.280)
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URITE (LUPRNT,211) 1, IALIF, IALTH, IDIRCL), SPEEDCL), TENPCL),
APTENPCL), PRESSCL)
                           SORT ALL THE DATA POINTS SO THEY AFFEAR IN ASCENDING ORDER OF ALTITUDE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 URITE THE SURFACE DENSITY AND ALL THE DATA POTHTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WRITE THE HEADER FOR SOUNDING OR FORECAST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALCULATE THE POTENTIAL TEMPERATURE
                                                                                                                                                                         IFCALTCJ) LE. ALTCJIDGO 10 57
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52 SPEED(1) = 0.515 + SPEED(1)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IFC I SMDFO . EQ. 13GO TO 64
                                                                                                                                                                                                                                                                                                                                                                                                                           DPTEMP(J) = DPTEMP(JI)
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IBIRCJ) = IDIRCJI)
IPIRCJI) = IARG
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TEST FOR RUMHING ON PLASMASCOPE OR CRT: LVERSH IS TRUE
IF RUMHING ON THE PLASMASCOPE...THEN TEST FOR RETURH (P),
WHICH WILL PROCESS MORE DATA, OR TERMINATE (T) UNICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TERMINATE EXECUTION -- WRITE OUT A HESSAGE
                                                                                                                                                                                                                                                                                                                                                  (AI, XI, 15, 0, 18, 0, 8, 0, 0, 18, 18, 18,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DELAY 5 SECUIDS BEFORE CLEARING SCOPE
                                                                                                                                                            CALL CHAP(0., YPOS.0.ILINE,24,3,0)
CALL CHAR(224., YPOS.0, ILINE(15),14,3,0)
CALL CHAR(352., YPOS, ), ILINE(23),12,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL CHAR(352., YPOS, 4, 1.1 NE(23), 12, 0, 0)
                                                                                                                  TERMINATE OF PROCESS MORE DATA?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VPGS = VPOS - 32,
CALL CHAP(3,,YPGS,0,ILTHE,64,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                               . 7,28,0,0)
                                                                                                                                                                                                                                              WILL STOP EXECUTION OF REED.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           82 CALL DREADCHAMEF, 13, 11.8HE)
CALL LERSCYPOS, LVERSH)
                                                                                                                                         DREADCHAMEF, 14, ILINE)
                                                                                                                                                                                                                                                                                                    FC 10115. HE. 1 HR.) GO TO 882
                                                                     PROCESS THE NEXT RUIL
                                                                                                                                                   LERSCYPOS, LVERSH)
                                                                                                                                                                                                                                                                                                                                                                        30 10 82
                                                                                                                                                                                                                                                                                                                                                                                                                    CALL LERSCYPUS, LVERST'
                                                                                                                                                                                                                                                                   IFCLVERSH) GO TO 881
READCLU, 90) IAHS
                                                                                                                                                                                                                                                                                                                                                                                                                              CALL CHAKCO, YPUSE
                      EXEC(9, RCLDR)
RND19(HAME, 0)
            RUPISCHAME, 1)
                                                                                                                                                                                                                                                                                                                                                                                              PROCESS NORE DA
                                              GRAF(1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                     YPOS = 458.
HGRAF
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                                                                                           CONTINUE
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                      CALL
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CALL PURGECTOCE, IERR, MAHE, C. C.

REINITIAGEZE SEOPERA PART OPPRATION

\*\*\* PURGE THE DISK FILE USED FOR STOPING COMING BLOCK DATA

CALL WAIT(3,2)

(8)

CB:

OF ALL SEGMENTS -- IF ERRORS ENCOUNTERED, WRITE OUT A MESSAGE AND TERMINATE REEDS PU 94 1=1, HUMSEG CALL IDRPO(MAMRP(1,1), IERR) IF(IEKR, GE, 0)GO TO 94 UKITE (LU,213) IERR STOP CALL CLEAR IFCLVERSN) CALL CLEAR CALL NGRAF TERMINATE REEDS STOP ENG ENG 4 3 

4-22

	- THIS SUBROUTINE READS AND WRITES COMMON APEAS TO DISC - 10 BE UTILIZED BY THE VARIOUS PEED PROCRAMS.		
	>>> COMMON AREAS		
	))) MATH PARAMETERS COMMON PI, PIOVR2, P143, TWOPI, SQR2PI, DEGRAD, RADUEC, 192	ÖK.	72
	>>> VEHICLE PARMETERS COMMON VPAR(18), SIGHCL	5	La
	))) OPTION PARAMETERS COMMON YPOS, YES, ISMDFO, IVHICL, IRUM, ICALC, IPLACE, ITIMEZ, ICOTHP, HAMFUN, LU, NUM, NGMLY, NFORM, LUPRNT, ITDU, IPLI, IFLZ, IFL3 INTEGER YES	Ē	•
<b>U</b> U U	))) WET DATA COMMON MLT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30), , SURVEH, FILE(3) INTEGER FILE	7	33.5
ں ں	>>> CALCULATION TIME COMMON ITIME, IDAY, INDMITK 2), IYEAR	r	
<b>0 0</b>	>>> SOUNDING TIME COMMON ISTING, ISYEAR	·	<b>J</b>
ပပ	>>> LAUNCH TIME COMMON LTIME,LTIM,LDAY,LMONTHK2>,LYEAR,LAUNTDC10> LOGICAL LTIME	1,	*
ပပ (	>>> CLOUD STABILIZATION AND LAYER PARAMETERS COMMON STBALT, STBAZD, STRPHC, STBTIN, CLURAD, RISTIMC30>, BOTLAY, TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, IP12	<b>‡</b>	ر-
UU (	<pre>&gt;&gt;&gt; DIFFUSION COEFFICIENTS</pre>	<b>'</b> ••	
ن ن	>>> CONCENTRATION AND DOSAGE VALUES AND RANCES COMMON COMMAN, CONCER, DOSTAY, RINGSHC, FINGSHC,	****	
U U			
	CPALZ03, 2PAP/ 1633, CPH0, VFAP/ 1733, CHHHAX, VFHP/ 1833 IN EGER GOGBC1443, GG FG 557		

LPEEDT T-00003 19 OH CK06003 USING 00141 BLKS K-6000

\*\*\* IF THE SCRATCH DATA FILE (i.e. \*REED2) ISH'T THEPE, CREATE IT \*\*\* 6 E U A R E !! 6E SUKE FILE IS PURGED BEFORE STAPTING RUN!!! COMMON ALTCOO), IDIRCOO), SPEEDCOO), TEMPCOO), PRESSCOO), PTEMPCOO), SUBROUTINE KSC65(18UF, 1ALT, CPTEMP, 1UANT, 1EOF, 1TING, 1DAYG, 1MONG, 1SBROUTINE KSC65(18UF, 1AND), RUMMANN ? COMMON YPOS, YES, ISBNFO, IVHICL, IRUN, ICHIC, IPLACE, ITTHEZ, IGOTNP, HUMFUN, LU, NUM, MONLY, MFORM, EUFRHT, ITEU, IPL1, IFL2, IFL3 \*\*\* ISIZECI) = 8 BLOCKS EXPECTED TO BE URITTER READ FURING PUN \*\*\* ISIZEC2) \* 8 UGRDS IN THE COMMON BLOCK TO BE TRANSFERPED DATA ISIZE/30,557/ THIS SUBROUTINE KEADS IN DATA FOR THE REED DIFFUSION CALL OPEHCOCO, IERR, HAME, 0)
1FC (IERR.LT.0), AND, (IERR.NE.-6)) URITE(6,770) IERR
FÜRMAT(" ••• MITEMFT TO OPEH, IERR =",14) COMMON PI, FIDVRZ, F143, TWOPI, SORZPI, DECRAD, PADDEC, IVZ IF( JJ.EG.) )CALL WRITF(ODCB.) IERR, OBUF.) ISIZE(2))
IF( JJ.EQ.0)CALL READF(ODCB.) IERR, OBUF.) ISIZE(2)) CALL CREATCOCCE, IERR, HAME, ISIZE, 3, 8, 8, 144.)
IF(IERR, LE. 0) WITE(6, 799) IERR MODEL FROM MAG TAPE IN KSC 1965 FORMAT FORMATC" \*\*\* CREATE/OPEN, IERR\*\*, 145 COMMON 1STINE, 150AY, 15HOHEZ), 15YEAP COMMON ITIME, IDAY, INDIVINCED, IYEAR \*\*\* KEAD OK WKITE, AS PER GRDER DINENSION MANECES , ISIZE(2) EGUIVALENCE COBUFCID, PID COMMON VPARC 183, STCHCL CALL CLOSE(ODCB, IERR) VEHICLE PARAMETERS SURFEIL, FILE(3) OPTION PARAMETERS CALCULATION TINE MATH FARAMETERS SOUNDING TIME COMMON AREAS LAUTCH TIME IFC LEPR .LT. 0) INTEGER FILE MET DATA INTEGER YES RETURN ? ? >>> 223 174 ?? ? >>> 787 783 662 822 889 9699 8699 5639 6165 0.66 G 2900 6963 1999 6663 9999 5999 9299 2299 6673 6674 9299 9299 6499 0690 1890 0032 6683 0084 5999 9860 6889 9699 6683 1690 2609 2600 0 1 9 0 1010 2014 6163 6194 1010 2399 6675 6677 1898 1691 1992 1999 1299 4-24

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KEEP READING UNTIL THE STANGARD LEVEL CATA IS FAILN

CLOUD STABILIZATION AND LAYER PARAMETEPS COMMON STBALT, STBAT, STBARD, STBTIM, CLUPAD, RISTIM(30), ROTLAY, TOFLAY, CALHT, LAYTOF, LAYBOT, REFLEC, IFTZ COMMON SIGKO, SIGK, SIGZO, SIGAP, KBIST, YBIST, EXPZ, SOSIGZ, SIGY, SIGAL, CHEATH, VPARC (80), CHEATH, VPARC (1)), CHEATA, VPARC (2)), CPHCL, VPARC (3)), CPCO, VPARC (4)), CPCO2, VFARC (5)), CPAL2G3, VPARC (6)), CPHO, VFARC (7)), CGAMMAX, VPARC (8)) INITIALIZE THE COUNTER FOR THE MINBER OF SETS OF DATA TO FORMAT ("0"5X"TIME: "14,1XA1,A2,4X"DATE: "12,1XA2,A1,1X14) 1001 FORMAT (14,3X12,1XA2,A1,1X14) 1002 FORMAT (1X16,3X13,5XF3.0,2XF5.1,3XF5.1,3XF6.1,15XF6.1) EQUIVALENCE (GC1, VPAR(1)), (GC2, VPAR(2)), (GC3, VPAF(3)), COTI, VPAR(4)), (OIZ, VPAR(5)), (OI3, VPAF(6)), (NA, VPAK(7)), (BB, VPAR(8)), (CC, VFAK(9)), SET THE FOF FLAG AND PETIFIN EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS COMMON COMMAK, CONCPK, DOSNÁK, DOSPK, RHGSNC, RHGSHÓ CONCENTRATION AND DOSAGE VALUES AND RANGES DIMENSION INONG(5,2), ITING(5), IDAYG(5) DIMENSION IBUF(!), IALT(!), DPTENP(!) CLDLHG, AYSFD, AVPIR, SIGAZ - IMMOCISHIFCIEUTS, -71,11 READ (0,1000) (IBUF(I),1=1,40) IMPUT FORMAT STATEMENTS OUTPUT FORMAT STATEMENT DIFFUSION COEFFICIENTS DINENSION STATEMENT READ DATA FROM TAPE CALL EXECCI3,8, JEGTS> AN EOF ON TAPE, IFCIEGF .EQ. 1 SPETURN DIMENSION STATMENTS INTEGER RUMUM FORMAT (48A2) TYPE STATMENTS 100I 1E0F **?**? ? \?\ 0001 2000 ٠ د Ü ĕ125 **6127 6128** 6123 9819 9619 150 1152 9510 6157 6158 1159 9919 9910 9910 0172 0173 0175 0177 6178 £122 6123 6124 9710 6133 1134 9135 1137 6138 61139 7 121 1163 1910 6165 1167 6910 1170 1219 1610 1210 550 4-25 (

COHMON LTINE,LTIN,LDAY,LMONTH(2),LYEAR,LANHIN(16)

LGGICM, LTIME

6120

1 . 2 . 2 . a.

READ (8,1002) IALT(1), IDIR(1), SPEED(1), TEMP(1), DPTEMP(1), PRESS(1), READ (0,1002) IALT(I), IDIR(I), SPEED(I), TEHP(I), DPTEHP(I), PPES(I) IF(SPEED(I), EQ. 959.0 GR. IDIR(I), EQ. 959.0GR IQ 27 IF(IDIR(I) EQ. 360)IDIR(I) = 0 IF(IDIR(I) GR. 1000.0G IG 34 IFC ISTINE.EQ. ITING(RUNNUN).AND. ISDAY.EQ. IGAYG(RUNNUM).AND. ISBANCI).EQ. INDIG(RUNNUM).15.AND. ISBANCI).EQ. INDIG(RUNNUM).15.AND. ISBANCI).EQ. INDIG(RUNNUM).255 GO TO 8 LIMIT DATA TO 30 POINTS -- READ THE MANDATORY LEVEL, DATA LINIT DATA TO 30 POINTS -- READ THE STANDARD LEVEL DATA READ (8,1001) ISTINE, ISDAY, ISHOH(1), ISHOH(2), ISYEAR READ (8: £000) (16UF(1),1=1,40) TF(16UF(2), EQ, 2HST)GO TO 7 TF(35UF(10),NE,2HOR, AND, 16UF(15),NE,2HOR)GO TO 25 CHANGE TO EST OR EDT DEPENDING ON LAUNCH TINE IF(SPEED(1):E0.999.0 .OR. IDIR(1).E0.999)G0 TO IF(IDIR(1) .E0. 36.)IDIR(1) = 0 IF(I .E0. 1)SURDEN = SURDN IF(160F(1).NE.2HEA .OR. 180F(2).E0.2HST3G0 T0 IF( IPLACE .EQ. 1) ISTINE = 19TINE - 300
IF(LAUNTD(4) .NE, 2H9T) ISTINE = 1STINE + 100
IF( ISTINE .GT. 0)GO TO 11
ISTINE = 2400 + 1STINE C. CHECK FOR SPECIFIED SOUNDING TIME AND DATE READ THE SOUNDING/FORECAST TIME 1F(16UF(2) .NE, 2HST)CO TO 4 READ (6,1000) (16UF(1).1=1,40) READ (8,1062) (18UF(1),1=1,40) FCIBUF(2), EQ. 2H5T)GO TO 7 FCIBUF(1), NE, 2HAL)GO TO 11 IF( IALT( I) . GT. 18080)G0 TO 22 FIND THE KEY WORD MANDATORY FIND THE KEY WORD ALTITUDE IFCHUM . GT. 30 NGO TO 34 IF ( 15NDG. EQ. 0 ) GO TO 0 ISTIME - ISTIME - 500 SURCH ISDAY - ISDAY - 1 MEND (8,1000) 1 DO 29 1=NIH, 30 06,1-1 61 00 CONTINUE CONTINUE CONT INUE HOH -22 = 2 25 27 500 000 **0 0 0** ပပ **0 0 0** 0162 6183 3184 6508 0209 0210 6226 0227 0227 0229 0230 1810 0610 2610 0193 0194 0195 6196 6610 0200 0202 0203 0205 0215 0220 0222 0195 0188 0109 6138 0201 0204 0213 0214 0223 0225 ù186 1910 1610 1610 0206 0207 0211 0221 0224 0231 0232 0234 0235 0236 6237 6238

4-26

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INCREMENT THE COUNTER -- IF THIS IS THE SET OF OATA DESIFED. WRITE BOUT THE BOTHDING/FORECAST TIME -- OTHERWISE GET THE MEXT THERE MUST BE 3 OR MORE DATA POINTS FOR THIS TO BE A VALID SET OF DATA -- IF THERE IS MIT, RETURN WITH IEOF=2 THIS SUBROUTINE RETURNS THE CURRENT TIME, DAY, INCHTH, AND YEAR URITE (LUFPHT, 2006) ISTINE, ITINEZ, LAUHITOCA), ISDA7, ISNOHCE), ISYEAR CALL EXEC TO RETURN CURRENT TIME, JULIAN DAY, AND YEAR MAKE APPOPEIATE ABJUSTMENTS IF THIS IS A LEAF TENP DATA MONTHS/2HJA, 1HM, 2HFE, 1HB, 2HMA, 1HF, 2HMP, 1HC, 2HMA, 1HY, 2HJU, 1HM, 2HJU, 1HC, 2HMU, 1HC, 2HG, 1HC, 2HGC, 1HT, 2HHQ, 1HV, 2HUE, 1HC, 2HGE, 1HC, 2HGC, 1HT, 2HHQ, 1HC, 2HUE, 1HC, 2HGC, 1HC, 2HGC, 1HC, 2HGC, 1HC, 2HGC, 1HC, 2HGC, 1HC, 2HGC, 2H, 31, 31, 30 USE JUST HOURS GATE MINUTES FOR THE TIME SUBROUTINE CETTO( ITINE, IDAY, INONIH, IYEAR) URITE GUT THE SUMMO HIG/FORECAST TIME DINEHSION INDUITH(2), NOUTHS(2, 12), IT(5) TYPE AND DIMENSION STATEMENTS ITIME - 100 - 17(4) + 17(3) IFCIGOT .LT. IMMITIGO TO 4 CALL EXECCIT, IT, IYEAP) IFCHUM GE. SORETURN CATA STATEMENTS INTEGER DAYNON(12) 1601 \* 1601 + 1 END OF KSC65 DAYHOH(2) - 28 = 1YEAP/4 34 MUM = 1 - 1 1E0F = 2 RETURN 6256 6255 6229 1279 6252 1253 6254 9529 6244 0245 9246 6247 9249 1221 1274 4-27

HIM IS THE HUMBER OF DATA FOLHTS

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THIS SUBROUTINE READS A SPECIFIED QUESTION FROM A SPECIFIED QUESTION FILE, THE QUESTION IS THEN DISPLAYED UPON THE FLASHASCOPE FOR PROCESSING. 1 1 THIS SUBROUTINE CHANGES BLANK FILLED WORDS TO ZEROS. CONVERT THE JULIAN DAY INTO A MONTH AND A DAY DINEHSION MANEF(3), IDCB(144), IBUF(40), ILINE(32) Call Open(10CB, 1ERP, Namef, 0) SUBROUTINE DREAD(HAMEF, LINH, ILINE) IFC4+1 .EQ. IYEAK JOAYHON(2) = 29 RETURN TO THE CALLING PROGRAM READ(160F, 100) (11 INE(1), 1-1, 32) IB = IAND(IA,177400B)
IF(IB ,EQ. 020000B)IB = 010000B
IC = JAND(IA,000377B)
IF(IC ,EQ. 000040B)IC = 000060B
IB = IOR(IB,IC) DO 10 1=1,LOOP CALL BLANK(15UF,40) CALL READF(16CB,1ERR,16UF) CALL BLAHK(16UF, 46) CALL READF(10CB, 1ERK, 18UF) IDAY = IDAY + DAYNON(I) INONTH(I) = MONTHS(I,I) INGNTH(2) = MONTHS(2,I) DO 7 1\*1,12 IDAY = IDAY - DAYHGH(I) IFC IDAY .LE. 8 360 TO 12 SUBROUTINE B22(1A, 1B) CALL CLOSECIDOB, IERRY 100F = LIMIN - 1 END OF GETTD FORMAT(3262) 164Y = 1T(5) CALL CODE CONTINUE CONT INUE RETURN RE TUPII RETURN ~ 2 --9 ပ္ပ 0300 9302 ĕ303 1069 3020 6305 0368 0309 0310 6318 5169 0320 0325 0323 0324 0325 0326 1328 0329 0331 0332 **6334** 0338 **5EE0** 0340 0342 0343 6345 0346 9460 6349 0350 0351 1029 9019 £1£9 1110 6315 0321 6335 9880 0347 0352 0323 9312 9169 1327 9337 0341 9317 031

4-28

OF POOR QUALITY

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DATA LINEI/ZHIE,2HST,2H H,2HBR/
DATA LINEZ/2HWI,2HWD,2H 9,2HY9,2HE,2HM ,2HID,2HWE,2HP ,2HHA,2HTH,
DATA LINEJ/2HCA,2HPE,2H C,2HAH,2HAY,2HFP,2HAL,2H A,2HFS,2H, ,2HFL,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DIMENSION IPARCS), NOBCH(144), NBUFCS9), NHM2C3), LINEIC4),
LINE2C11), LIME3C12), LINE4C50), LINE5C59), LIME6C34),
LEVELC7), IUGC7), IUSC7), IGSC7), LEVL2C2), ITEM: 2), IDFC2),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   THIS SUBROUTINE FILLS A SPECIFIED ARRAY WITH A SPECIFIED
                                                                                                                                                                                                                                                                                                        THIS SUBROUTINE ERASES A SPECIFIED LINE OF 64-CHARACTERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           THIS PROGRAM CREATES A DATA FILE ON DISC FOR ADDING ++ TOWER DATA TO THE REED PROGRAMS, THE FORMAT IS ++ GIVEN IN TM-2333?.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CALL CHAR(0.0, VPOS,0, IER8,64,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SUBROUTINE TOWER(LU, NOAT, IVHICL, CAUH)
                                                                                                                                                                                                                                        SUBROUTINE LERS(YPOS, LVERSH)
SUBROUTINE PLANK(1BUF, 11)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C DIMENSION AND DATA STATEMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                 JFC YPOS . GT. 48. 0)CO TO
                                                                                                                                                                                                                                                                                                                        FROM THE PLASMASCOPE.
                                                                                                                                                                                                                                                                                                                                                                                     DIMENSION IERS(32)
                                                                                                                                            DIMENSION IBUF(40)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         HDG1(3)
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                                                                             HUMBER OF BLANKS.
                                                                                                                                                                                                                                                                                                                                                                                                     DATA 1ER8/32+2H
                                                                                                                                                           CATA IBLK/2H / CO 10 1=1,11
                                                                                                                                                                                          19UF(1) = 1BLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DATA IBLKS/2H
                                                                                                                                                                                                                                                                                                                                                                                                                                                     YP08 - 458.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL CLEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RETURN
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125 FORMAT(" THE RELATIVE HUMIDITY AT 54 FEET (2 IN.KXK) ")
126 FORMAT(2(12,2X), 12, 1X, 14,2X, 12,2 (1X, 13), 3(2X, 12,2X, 12, 1X, 13),
2(2X, 12), 1X, 13,2 (1X, 13), 3X,54.1,2X,2(64.1,1X), F4.1,2 (1X, 13),
127 FORMAT(" DATA FILE,", 1X, 3A2, 1X,", 1S READY")
128 FORMAT(36X,3(13,2X,12,2X,12,1X), 42X)
129 FORMAT(" IS THERE DATA FOR ANGINER VEHICLE USING THE SANE TIME")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        110 FORMAT(" THE YEAR (INIXX) ")
111 FORMAT(" THE INTEGER REPRESENTING THE MONTH (INIXX) ")
112 FORMAT(" THE DAY OF THE MONTH (INIXX) ")
113 FORMAT(" THE DAY OF THE MONTH (INIXX) ")
114 FORMAT(" THE TIME (2) (INIXXXX) ")
115 FORMAT(" THE TIME THE FORMAT (INIXXX) ")
116 FORMAT(5X, "UIND DIRECTION (DEG INIXXX) ")
117 FORMAT(5X, "UIND SPEED (KTS INIXX) ")
118 FORMAT(5X, "UIND SPEED (KTS INIXX) ")
119 FORMAT(" THE", IX, I2, IX, FOOT DEW POULT (DEG F INIXXX) ")
120 FORMAT(" THE LAPSE RATE (DEG F INIXXX) ")
121 FORMAT(" THE SPFH DISTANCE (NI INIXX,X) ")
122 FORMAT(" THE SPFH DISTANCE (NI INIXX,X) ")
123 FORMAT(" THE SPFH DISTANCE (NI INIXX,X) ")
124 FORMAT(" THE STANDARD DEVIATION OF THE WIND AZINUTH MISLE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              109 FORMATIC/" IS THE DATA ENTERED CORRECTLY SO FAR? (LLAJY-YESLLAD"
                                                                                                                                                                                                                                                                                        , 2HCZ, 2H3 , 2H , 2H , 5 H5 , 2H5 , 2H5 , 2H5 , 2H5 , 2H5 , 2H1 , 2H  , 2H5 , 2H  ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FORMAT(" THE MAME OF THE FILE TO BE USED (Inidadada) ... FORMAT(" TERR ..., 14)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        . 24K,12,4%,12,2%,12,1K,14,1%,13)
132 FORMATC 5%,13,8%,13,5%,12,5%,12)
133 FORMATC/* THE TEMPERATURES AND DEW POINTS ENTFRED MRE;*/
5%*ALTITUDE TEMPERATURE DEW POINT*/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          131 FORMATCY" THE DATA ENTEPED IS: YEAR HOUTH DAY TIME INT"
                                                                                                                                                                                                                                                                                                                                                                             ,2HC3,2H54,2H>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ZSPFH STGMA FILT
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. 2H54, 2H F. 2HT
                                   FORMATCA" THE TEST NUMBER (INIXXXXX) ...
                                                                                                                                                                                                                                           , 2HTT, 2H
                                                                                                                                                                                                                                                                                                                                                                                                                                            DATM LEVEL/12,54.162,204.295,394,492/
Data Levl2/6,54/
Data Ham2/2HTD,2IWE,2HRS/
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1X, "< Y"YES, LEGJII=INERDE)
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5X,* LAPSE RATE SFPH 2
                                                                                                                   2HSP, 2HB , 2HGS, 2HT
2HD1, 2HR , 2HSP, 2HD
                                                                                                                                                                                                                                                                                                                                                                                                                , 2HC 4 , 2H92 , 2H)
                                                                             211110, 211K , 21101, 211K
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   .2H D, 2HIR.2H
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136 FORMATC" ENTER NOOE: LEGJU=OPERATIONALLEGO,P=PRODULTION"
",R=RESEARCH ")
137 FORMATC/" ENTER THE VEHICLE LEGJS=SHUTTLELGO,T=TITAH,S=FELTA ")
138 FORMATC/" BO YOU WANT A DETAILED DATA FILE" CY=YES,LEGJS=HIGGGG=)"
                                                                                                                                                                                    141 FORMAT(~" THE TEMPERATURES ENTERD ARE:"/SX,"ALTITUDE"
142 FORMAT(~" IS THERE DATA FOR ANOTHER TOUR NUMBER USING THE SAME"
143 FORMAT(~" IS THERE DATA FOR ANOTHER TOURR NUMBER USING THE SAME"
143 FORMAT(~" ENTER TATA FOR ANOTHER TOURR NUMBER USING THE SAME"
135 FOXNAT(/" FOR TOWER INTHBER", 1X, 13, 1X, "THE DATA ENTERED 15;"/5X," ALT BIRECTION SPEED GUSTS"/)
                                                                                                                                                    139 FORMATK SK, 13, 8X, 13, 5X, 12)
140 FORMATK/" FOR TOVER HUMBER*, 1X, 13, 1X, "THE DATA EHTERED 15:"/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SET THE VARIABLE "MILE" IDENTIFYING THE RUMING MODE, OFERATION,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            OR PROFUCTION. IF IN OPERATION HOVE, ENTER ONLY THE DATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  UPITE THE TEST NUMBER TO THE FILE -- LET THE TEST HIMPER FEFFOULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             THAT IS ABSOLUTELY HETESSARY...IF IN THE PRODUCTION MODE, ALLOW THE USER TO DECIDE WHETHER OR MOT TO EXTER ALL OR ONLY ESSENTIAL DATA...IF IN RESEARCH MIDE, ENTER ALL DATA. THE VARIABLE, '101K'
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GET THE MAME OF THE DATA FILE TO BE USED OR CREATED ---LET THE FILE MAMED "TOWERS" BE CREATED IF ONLY ESSENTIAL DATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JECIEPR.LT.0) CALL CREAT(NDCB, JERR.NAM2.4,4,0,6,144)
JECIEFR.LT.0) UPJTE (LU,101)JERR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C TESTS FOR ALL OR ONLY ESSENTIAL DATA INPUT.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               OPEN OR CREATE THE DATA FILE HEEDED
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C ENTER THE DATE, TIME, AND TIME INTERVAL, LET THE TIME AND DATE
C DEFAULT TO 99 AND 9959 IF GALY ESSENTIAL DATA IS BEING ENTERED.
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                                                                                                                                                                                                                                                                                                                                                                                   C URITE THE FIRST LINE OF THE HEADER FOR THE DATA COLUMNS C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            C URITE THE SECOND LINE OF THE DATA COLUMNS HEADINGS C
                                                                                                                                                                   CALL CODE
CALL WRITF(NDCB, IERR, NBUF, 11)
IF(IERR.LT.0) WRITE (LU, 101) IERR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF( IERR.LT. 0) URITE (LU, 101) IERR
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                                                                                                  C URITE WIND SYSTEM TOWER DATA HEADING
                                              CALL WRITECHOOD, IERR, HBUF, 7)
PECIEER.LT.0) WEITECLU, 10131EER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL UKITECHDCB, IERR, HBUF, 34)
                                                                                                                                                                                                                                                                                                                                                                                                                                                         CALL CODE
CALL WRITF(HDCB, IERR, NBUF, 59)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CALL CODE
CALL WRITE(NDCB, IERR, NBUF, 58)
                                                                                                                                                                                                                                                                                                                           CALL WRITE(HDCB, IERR, HBUF, 12)
                                                                                                                                                                                                                                            C URITE THE CAPE CANAVERAL HEADING
              URITECHBUF, 104 JLINEI, HTEST
                                                                                                                                                                                                                                                                                                                                                                                                                                    URITE CHOUF, 106 XL ! ME4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WRITE CHBUF, 106 JUINES
                                                                                                                                                                                                                                                                                            URITE (HBUF, 105)LINE3
                                                                                                                                                    URITE (MBUF, 103)LINE2
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READ (LU,210) IYR
WRITE (LU,111)
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IF ENTERING ESSENTIAL DATA OMLY, ASK FOR INPUT AT THE 12, 54, AND TOP OF THE TOWER LEVELS
                                                                                                                                                                                                                SET THE TOWER ""HBER ACCORDING TO THE LAUNCH VEHICLE: IF SHUTTLE, TOWER HUMBER = 313, AF TITAN, TOWER NUMBER = 110, IF DELTA, TOWER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF NOT ENTERING ONLY ESSENTIAL DATA, ASK FOR TIMUT AT EACH LEVEL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF ENTERING ESSENTIAL DATA ONLY, BEGIN BY GETTING DATA FOR THE 12 AND 54 FOOT LEVEL REGARDLESS OF THE LAUNCH VEHICLE. SET THE WIND GUST SPEEDS TO 99.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C IF ENTERING GALY ESSENTIAL FATA SET ALL FATA AT 162, 284, 295, C 394, AIM 492 FOOT LEVELS TO 99 OR 999.
                                                                                                                                                                                                                                                                                   IF IN THE RESEARCH NOVE, ENTER THE TOVER NUMBER
WRITE (LU, 131) IVR, MON, IDAY, ITIN, JHT
                                                                                                                                                                                                                                                                                                                                      IF(IVHICL.EQ.0) NTUR = 313
IF(IVHICL.EQ.1) HTUR = 110
IF(IVHICL.EQ.2) NTUR = 303
GO TO 6
                                                    IFCIAMS.EQ. IMMS GO TO 3
                                                                       IFCIANS.EQ INSIGO TO 999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WRITE (LU, 130) LEVEL(K)
                                                                                                                                                                                                                                                                                                                         1FK 1RUH. EQ. 1) GO TO 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         URITE (LU, 130)LEVEL(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1F(101K.EQ.1) GO TO 6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             READ (LU,213) IND(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            READ (LU, 218) IUS(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            READ (LU, 213) JUDGJ)
URITE (LU, 117)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                READ (LU, 210) IGS(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              READ (10,210) 145(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     URITE (LU, 143) HTUR
                                   READ (LU, 269) BANS
                                                                                                                                                                                                                                                                                                                                                                                                                                READ (LU, 213) HTUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WRITE (LU, 117)
                URITE (LU, 109)
                                                                                                                                                                                                                                                                                                                                                                                                         URITE (LU, 115)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              URITE (LU, 118)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WRITE (LU, 116)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           URITE (LU, 116)
                                                                                                                                           16AY = 99
171H = 9999
1N? = 99
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DO 7 K=1,7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         50 9 J-1,2
                                                                                                                                                                                                                                                    C MINGER = 303.
                                                                                                          IYR = 99
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IF ENTERING ESSENTIAL DATA OMLY AND IF THE LAUNCH VEHICLE IS A SHUTTLE CRAFT, THEN PICK UP THE TOP OF THE TOUER DATA (1E.492 FI.)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             C ENTER THE TEMPERATURE AND DEW POINT FOR THE 6 FOOT ANN. 34 FOOT
C LEVELS IF ENTERING ALL. DATA, OTHERWISE JUST ENTER THE TEMPERATURES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IFCIDIK.ED.I) DRITE (LU,141) LEVL2(1), ITEN(1), LEVL2(2), ITEN(2)
IFCIDIK.ED.B) URITE (LU,133)LEVL2(1), ITEN(1), IOP(1), LEVL2(2),
ITEN(2), IOP(2)
                                                                                                                           C IF THE LAUNCH VEHICLE IS TITAN, THEN PICK UP THE TOP OF THE TOMER C DATA (IE, 204 FOOT LEVEL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                        URITE THE VALUES ENTERED BACK TO THE CRT FOR USER APPROVAL BEFORE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DO 17 K=1,7
IFCIGIK.EG.I.AHD.IUDCK).EQ.999) GO TO 17
IFCIGIK.EG.I) UPITE (LU,139) LEVEL(K),IUDCK),IUSCK)
IFCIGIK.EG.0) URITE (LU,132)LEVEL(K),IUDCK),IUSCK),IGSCK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IF(101K.EQ.0) WRITE (LU,135)HIUR IF(101K.EQ.1) URITE (LU,140)HIUR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 READ (LU,213) ITENCK)
IF(IDIK.ED.I) INPCK) = 999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           URITE (LU,109)
REID (LU,209) IANS
IF(IAN9.EG,IMN) GO TO 6
IF(IANS.EG,IHS) GO TO 999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IFC LANS. EQ. 1111 GG TO 18
IFC LANS. EQ. 1115 ) GG TO 999
                                                                                                                                                                                                   IF( IVHICL.EQ. 1) GO TO 13
IF( IVHICL.EQ. 1) GO TO 13
                                                                                                                                                                                                                                                     URITE (LU, 130) LEVEL(4)
                                                                                                                                                                                                                                                                                                                                                         URITE (LU, 130) LEVEL(7)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 URITE (LU, 119) LEVL2(K)
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                                                                                                                                                                                                                                                                                        READ (LU, 213) 1WG(4)
                                                                                                                                                                                                                                                                                                                        READ (LU,210) 103(4)
                                                                                                                                                                                                                                                                                                                                                                                        READ (LU,213) 14D(7)
WRITE (LU,117)
                                                                                                                                                                                                                                                                                                                                                                                                                           READ (LU,218) 149(7)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  READ (LU,213) JOP(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   READ CLU, 2090 TAHS
                                                                                                                                                                                                                                                                                                      WRITE (LU, 117)
                                                                                                                                                                                                                                                                       URITE (LU, 116)
                                                                                                                                                                                                                                                                                                                                                                        WRITE (LU, 116)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    URITE (LU, 189)
              10(1) = 999
                               148(1) = 99
50 11 J-3,7
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WRITE (MBUF, 128) IWO(5), IWS(5), IGS(5), IWD(6), IWS(6), IGS(6), IWD(7), IWS(7), IGS(7)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WRITECHBUF,126) IYR,MOH,IDAY,ITIH,IHT,HTUR,JUDC1),JUSC1),IGSC1),
IUDC2),JUSC2),IGSC2),IUDC3),JUSC3),JUSC3),JUDC4),
IUSC4),JGSC4),TERC1),JDPC1),JDPC2),RATEL,PPH5,
                                                                                                              ENTER THE LAPSE RATE, S PPM DISTANCE, 25 PPM DISTANCE, THE STANDARD DEVIATION OF THE WIND AZIMUTH ANGLE, AND THE RELATIVE HUMIDITY AT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C SEE IF THERE IS DATA FOR ANOTHER TOWER USING THE SAME DATE AND TIME C IF ENTERING ALL DATA. --IF IN OPERATIONAL MODE, DO NOT ASK FOR OTHER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C LAUNCH VEHICLES--AND CLOSE THE FILE. IF IN OPERATIONAL NODE, TEST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C IF OTHER LAIMCH VEHICLES OR TOWER NUMBERS ARE TO BE INFUT IN THE C PRODUCTION OR RESEARCH MODE, LOOP BACK TO THE BECHNING OF THE
IF ENTERING ONLY ESSENTIAL DATA, SET LAPSE RATE, 5 PPM DISTANCE, 25 PPM DISTANCE, SIGNA OF WIND AZIMUTH, AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          URITE (LU, 134)RATEL, PPMS, PPM25, SDEV, IRH
URITE (LU, 109)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PPN25, SDEV, ITEN(2), IRH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       C FOR ESSENIAL DATA CMLY OR ALL DATA INPUT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IFCIERR.LT.O>URITE CLU,181> 1ERR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CALL HRITF(HDCB, IERR, HBUF, 58)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALL URITF(NDCB, IERR, HBUF, 58)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; <1RUN,EQ,2) GO 72 999
FCTRUN,EQ,3) WELLE (LU,129)
FCTRUN,EQ,1) WRITE (LU,142)
                                                     RELATIVE HUMIDITY TO 99.9 OP 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C URITE THE PATA TO THE DISC FILE
                                                                                                                                                                   54 FEET IF ENTERING ALL DATA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IFCIANS.EQ. HMS GO TO 20 IFCIANS.EQ. HSS GO TO 999
                                                                                                                                                                                                                            1F<101K.EQ.1) GO TO 21
                                                                                                                                                                                                                                                                                                                                                                                                  READ (LU, 221) PP M25
                                                                                                                                                                                                                                                                               READ (LU, 221) RATEL
                                                                                                                                                                                                                                                                                                                                            READ (LU, 221) PPHS
                                                                                                                                                                                                                                                                                                                                                                                                                                                          READ (LU, 221) SINEV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    READ (LU, 209) IANS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             READ (LU, 213) IRH
                                                                                                                                                                                                                                                                                                                                                                        URITE (LU, 123)
                                                                                                                                                                                                                                                                                                                                                                                                                            WRITE (LU, 124)
                                                                                                                                                                                                                                                                                                                WRITE (LU, 122)
                                                                                                                                                                                                                                                        WRITE (LU, 121)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WRITE (LU, 125)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SDEV = 99.9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            22 CALL CODE
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CONNON ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), FTEMP(30),
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COMMON YPOS, YES, ISHOFO, IVHICL, IRUN, ICALC, IPLACE, ITINEZ, IGOTMP,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBUN, LU, NIM, NOILY, MFORM, LUFRNT, 110U, 1FL1, 1FL2, 1FL3
                                                                                                                                                                                                                                                                                                                                                        THE++
                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMON PI, PIOVRZ, F143, TWOPI, SOR2PI, DECRAD, RADDEG, 1V2
                                                                                                                                                                                                                                                                                                                                                                                             C++ 73337 FORMAT AND REFORMATS THE DATA TO CONFORM TO C++ SOUNDING/FORECAST DATA FORMAT.
                                                                                                                                                                                                                                                                                                                                                                               C++ THIS PROGRAM READS WIND SYSTEM TOWER DATA IN TMX-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SOUNDING TIME
CANNON ISTINE, 1964, ISMIN 2), 19959R
                                                                                                                                                              TELL THE USER HIS DATA FILE HAME ACAIN
                                                                                                         JECTERR.LT.0) WRITE (LU,101)JERR
CALL CLOSECHDGG, JERR)
JECTERR.LT.0) WRITE (LU,101) JERR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMON ITIME, IDAY, INGNIHC2), IYEAR
                                                                                                                                                                                                                                                                                                                                         SUBROUTINE FORTD(HAM2, IALT, KHUM)
                                                                                          CALL WRITF(NDCB, IERR, NBUF, 1)
                                         CLOSE THE DATA FILE BEING USED
            IFCIANS, EG. INY) GO TO 5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMMON VPARCIBY, SIGHEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VEHICLE PARAMETERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SURPEN, FILE(3)
                                                                                                                                                                                        URITE (LU, 127) HAME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALCULATION TIME
READ (LU, 209) IAHS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MATH PARAMETERS
                                                                                                                                                                                                                               DO 25 K=1,3
HDATCK) = HAH2CK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONHON AREAS
                                                                   HBUF(1) = 2HEH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INTEGER FILE
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COMMON STBALT, STBHT, STBAZD, STBATM, STBTIM, CLDRAD; RISTIM(30), BGTLAY.
TOPLAY, GALHT, LAYTOP, LAYBOT, REFLEC, 1PTZ
                                                                                                                                   DIFFUSION COEFFICIENTS
COMMON SIGK, SIGK, SIGR, SIGAP, XDIST, YDIST, EXFZ, SOSIGZ, SIGY, SIGAL
                                                                                                                                                                                                                                                                                                                                 (HEATH, VPAR(18)), (HEATH, VPAR(11)), (HEATA, VPAR(12)),
                                                                                                                                                                                                                                                                                                                                                                (PAL 203, VPAK(16)), (PHO, VPAR(17)), (GANHAX, VPAR(18))
                                                                                                                                                                                                                                                                                                                                             (PHCL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VFAR(15))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SET THE TOWER NUMBER ACCORDING TO THE VEHICLE HUMBER PASSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                          ITEM(15), LEVEL(7), NAM3(3), KDCB(144), KBUF(58)
                                                                                                                                                                                                                                                                             EQUIVALENCE (QCI, VFAK(1)), (QC2, VPAR(2)), (QC3, VPAF(3)),
                                                                                                                                                                                                                                                                                                (QT1, VPAR(4)), (QT2, VPAR(5)), (QT3, VPAR(6)),
                                                                                                                                                                                                                                                                                                                                                                                                                                     DIMENSION HAM2(3), HDCB(141), HBUF(58), JUD(30), JUS(30),
                                                                                                                                                                                                                                                                                                                (AA, VPAR(?)), (BB, VPAR(B)), (CC, VPAR(9)),
               COMMON LIIME, LTIN, LDAY, LHONTH(2), LYEAR, LAUNTO(10)
                                                                                                                                                                                                                         COMMON COMMAY, COMPR, DOSMAY, DOSPR, RHGSHC, RHGSMD
                                                                                                                                                                                                                                                               EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS
                                                                                                                                                                                                           CONCENTRATION AND DOSAGE VALUES AND RANGES
                                                                 CLOUD STABILIZATION AND LAYER PARAMETERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FORMAT(20%,13,1%,1%,143,2%,12,5%),13,32%,13)
FORMAT(16,1%13,1%F4,1,F6.1)
FORMAT(16,1%13,1%F4.1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DIMENSION IALT(30), UPTEMP(30), MANE(3)
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                                                                                                                                                                         CLULNG, AYSFD, AVDIR, SIGAZ
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FORMAT("TUR HBR",1X,13,1X)
FORMAT(16,1X13,1X13,F6.1)
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READ (HBINF,214)ITUR,1WC(1),1WS(1),1WD(2),1WS(2),1WC(3),1WS(3),1WS(3),1WS(4),1TENC(1),1TENC(2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              REND (HBUF,144) 140(5),143(5),146(6),145(6),146(7),145(7)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        C READ THE DATA FROM THE TMX 73337 FORMATTED FILE AND UPITE IT
C TO THE DISC FILE "REM:ER" IN THE SAME FORMAT AS THE SOUNDING/
                                             CALL OFEHKKDCB, KERR, HAM3, 6)
IFCKERE, LT. 6) CALL CREATCROCB, KEPF, HAM3, 4, 4, 6, 6, 144)
IF CVEKE, LT. 6) URITE (LU, 161) KERR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WRITE (KBUF, 146) (EVELCE), TURCED, TUSCED, ITERCED
                                                                                                            C READ LINES OF THE DATA FILE UNTIL DATA IS FOUND
                                                                                                                                          3 CALL READF(MCCB, IERR, MGUF, 58, LEN)
IF(IERE, LT, 6) WRITE (LU, 1615 IERR
IF(MGUF(1), EQ, 2MYE) CG TG 4
IF(MGUF(1), EQ, 2MF) CO TO 99
                                                                                                                                                                                                                                                                                                   READ (HBUF, 196) (HBUF(1), 1=1, LEN)
CALL READF(HDCB, IERR, HBUF, 50, LEN)
IF(1ERR, LT.0) UF IE (LU, 101) IERR
IF(HBUF(1), EQ, ZHEN) GO TO 99
                                                                                                                                                                                                                                                                                                                                                                                 RESO CHBUF, 106) CHBUF(1), 1=1, LEN)
CALL CODE
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CALL READF(NDCB, IERR, NBUF, 58, LEN)
                                                                                                                                                                                                                                                                                                                                                                                                                               IFCIERR.LT.8) WRITE (LU,181) IERR
IFCHBUFCI).EQ.ZHEH) GO TO 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             READ (HBUF, 106) (PSUFCI), I=1, LEN)
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CALL READF(HDCB,IERR,MBUF,50,LEH)
IF(IEKR.LT.0) WRITE (LU,101) IERR
IF(MBUF(1).E0.24EN) GG TO 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CALL READF(HDCB, IERR, HBUF, 58, LEM)
IF(HBUF(1).EG, 24EN) GO TO 99
IF(TERK,LT.0) URITE (LU,101) IERR
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                CREATE THE DISC FILE "READER"
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WRITE (KBUF,146) LEVEL(2),1W0:2),1W5(2),1TEM(2)

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C CONVERT THE TEMPERATURE IN THE TOWER DATA FROM DEGREES C F TO DEGREES C.
                                                                                                                                                                                                                                                C PUT AN END OF FILE MARK ON THE DATA FILE "READER" AND C CLOSE BOTH FILES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       READ (KBUF, 215) IALT(J), IDIR(J), SPEED(J), TEMP(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF THE LAUNCH VEHICLE IS A DELTA (TOWER MUMBER 303),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          C LOOP UNITIL THE CORRECT TOWER NUMBER IS FOUND
                                                                                                                                WRITE (KBUF, 147) LEVEL(1), 100(1), 105(1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COLL READECEPEDB, MEDE, ACTUAL IF CKERR.LT.00 URITE CLU, 1015 MERP IF CKBUFCI.J.EQ.2HEN) GO TO 999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               33 CALL READF(XDCB, KERR, KBUF, 40.LEH)
1F (KERR.LT.0) WRITE (LU, 112) KERR
1F (KBUF(1).E0.2HEM) G0 T0 999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL READF(KDCB,KERR,KBUF,40,LEN)
IF (KERR,LY,0) URITE (LU,112) KERR
IF (KBUF(1),E0,2HEN) GO TO 999
                                                                                                                                                                                                                                                                                                                                                                                                   CALL CLOSE(NDCB, IERR)
CALL CLOSE (KDCB, KERR)
IF(IERR,LT.0) UKITE (LU, 102) IERR
IF(KERR,LT.0) URITE (LU, 102) KERR
CALL OPEN(KDCB, KERR, HAM3, 0)
               CALL WRITF(KDCB, KERR, KBUF, 10)
IF(KERR, LT. 8) WRITE (LU, 101) KERR
IF(ITUR, EQ. 303) GO TO 99
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IF(KERR.LT.0) URITE (LU, 112) KERR
                                                                                                                                                                                      IFCKERR, LT. 0) URITE (LU, 101) KERR
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                                                                                                                                                                                                                                                                                                                                                                                     CALL URITF(KDCB, KERR, KBUF, 1)
                                                                                                                                                                   CALL WRITF(KDCB, KERR, KBUF, )
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 CALL CODE
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#### ORIGINAL PAGE POOR QUALITY

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COMMON STBALT, STBHT, STBAZD, STBRNG, STBTIM, CLDRAD, RISTIM(30), BOTLAY. TOPLAY, CALMT, LAYTOP, LAYBUT, REFLEC, IPTZ COMMON SIGKO, SIGK, SIGZO, SIGAP, KDIST, YDIST, EXPZ, SOSIGZ, SIGY, SIGAL \*CAB,810914 CHEATH YEAR (CERTON TYPARCES), CHEATH, VEARCIESS, COMMON ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30), (PRI203, 9PARC16 )), (PHG, 9PAPA 17 )), CONTHOR, 9PAPA 18 )) COMMON YPUS, YES, ISHDFD, IVHICL, IRUN, ICALC, IPLACE, ITIMEZ, IGOTMP, HUMRUH, LU, NUM, MONLY, MFORM, LUPRNT, ITDU, IPL1, IPL2, IPL3 9 EQUIVALENCE (QCI, VPAR(1)), (QC2, VPAR(2)), (QC3, VPAR(3)), (Q11, VPAR(4)), (Q12, VPAR(5)), (Q13, VPAR(5)) A PROGRAM IN THE REED SERIES COMMON PI, PIOVRZ, FI43, TWOPI, SURZPI, DEGRAD, RADDEG, 1V2 (A4, VPAR(7)), (19, uthange)), ((C, VPAR(9)), COMMON LTIME, LTIM. LDAY, LMONTHS 2), LYEAR, LAUNTDS 10) EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS COMMON COMMAX, COMPK, DOSMAX, DOSFK, PHESHC, RHGSMD CONCENTRATION AND DOSAGE VALUES AND KANGES COHFE, WFIIK(133), CPCB, WFIIK(14.15. CLOUD STABILIZATION AND LAYER PARAMETERS FTN4%,L PROGRAM RCLDS(3),REEDS CLOUD RISE PROGRAM LRCI, 05 7-0004 15 GN CROCOO3 USING 00671 BLKS R=6000 SOUNDING TIME COMMON ISTIME, ISDAY, ISHOW 22, ISYEAR COMMON ITIME, IDAY, INONTH(2), IYEAR CLDLHG, AVSFD, AVD IR, SICAZ DIFFUSION COEFFICIENTS CLOUD RISE PROGRAM CONNON VPAR(18), SIGHCL LOGICAL LTIME, LVERSH VEHICLE PARAMETERS SURVEN, FILE(3) OPTION PARAMETERS CALCULATION TIME MATH PARAMETERS COMNON APEAS LAUNCH TIME INTEGER FILE HET DATA INTEGER YES PROGRAMS ? ? ?? ? ??  $\hat{\hat{x}}$  $\hat{\hat{z}}$ ? ပပ ပ ပ Ú ن ں ں ပပ ပ 620 2 1925 626 2 T 043 0049 622 023 624 **6026** 0023 0030 103 033 970 0655 1157 120 E9 00 021 0057 4-41

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205 FORMAT (//*0****TOP OF SURFACE LAYER NETEOROLOF CAL PARANETERS*
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                                                                                                                              200 FORMAT ("1"27X"EXHAUST CLOUD"/"OLEVEL"4X"ALTITUDE"17X
"RISE TIME"5X"RAHGE"6X"DIRECTION"/16X"(HETERS)"17X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DINENSION NAME(3), NAMEF(3), ILINE(32), IDATAF(10), IERS(32)
                                                                                                                                                                              201 FORMAT (2XI3.5XF7.1,5X*ADIABATIC*5X3A2,6XF7.1,7XF5.1)
202 FORMAT (2XI3,5XF7.1,6X*STABLE*7X3A2,6XF7.1,7XF5.1)
203 FORMAT (//*0***CLOUD STABLIZATION****/
6X*HEIGHT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    208 FORMAT (//*0SIGMA OF WIND AZINUTH ANGLE, SIGAZ: "F4.1)
209 FORMAT (//*0EFFECTIVE CLGUD NEIGHT(M): "F6.1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EQUIVALENCE (ILIN23, ILINE(23)),(ILIN24, ILINE(24))
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DATA HAMEZZH-R,ZHEE,ZHD2Z, NAMEFZZH?R,ZHCL,ZHDSZ
                                                                                                                                                                  *(SECOIMS)*4X*(NETERS)*4X*(DEGREES)*;
                                                                                                                                                                                                                                                                                   6X*DINECTION FROM PADYDEG): "F5.1)
                                                                                                                                                                                                                                                                                                                                                                                                      (//"0****DIFFUSION PARAMETERS****
                                                                                                                                                                                                                                                                 6X"RANGE FRON PADCHOL "F7.17
                                                                                                                                                                                                                                                                                                                                                                   6X"UIND DIRECTION(DEG): "13/
6X"UIND SPEED(N/SEC): "F4.1)
                                                                                                                                                                                                                                                                                                                                                                                                                     6X"MEAN SPEED(M/SEC): "F4.1/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TYPE AND DIMENSION STATEMENTS
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                                                OUTPUT FORMAT STATEMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTEGER RMETP(3), RCONC(3)
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DATA RECONCZURC, 2HDM, 1HSZ
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                                                                                   100 FORMAT (F6.1)
                                                                                                  FORMAT (F7.2)
                                                                                                                102 FORMAT (F4.1)
C*** IMPUT FORMATS
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FDEG - ABSCFLOATCIDIRCLY - IDTRCIMITY

15cbbeg, GT, 188.) DDEG = 360.0 GDIN = DDEG/DALT

1F(1PTZ.EQ.1)G0 TO 57

CALCULATE METEMENTOCTON PHO

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9175

GPTENP = (PTENP(1) - PTENP(1N1))/DALT GSPEED = (SPEED(1) - SPEED(1N1))/DALT

DALT - ALTCI) - ALTCINI)

6910 171 9172

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CALCULATE SOME DUANTITIES TO BE USED IN SUBSEQUENT DO LOOP
                                                                                                                                                                                                                                                                                                                                                                             ALPHAC = 5.12913086E-02*(TEMP(1) + 273.16)*SURDEH+GAHMAX**3
ALPHAC = ALPHAC/(HEATH * QCI)
GT = 9.8/(TEMP(1) + 273.16)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CC***URITIEN IN CR-2631, PAGE 15, FOR A LEAST SQUARE RECRESSION CC***URITIEN IN CR-2631, PAGE 15, FOR A LEAST SQUARE RECRESSION CC***FIT FOR THE WEIGHT RATE OF CHANGE FOR POTENTIAL TEMPERATURE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CALCULATE SLOPE OF POTENTIAL TEMPERATURE, SPEED, AND DIRECTION IN LAYER
                                                                                                                                                                                                                                                                                                                                                                                                                                        DO LOOP TO CALCULATE EXHAUST CLOUD PARAMETERS
                                                                                                                                                                                                                                                                                       WRITE OUT THE EXHAUST CLOUD HEADER
INITIALIZE SOME LOCAL VARIABLES
                                                                        - ALTITUDE INCREMENT
- ITERATION COUNTER
                            ) - CLOUD RISE TIME
                                                                                                                                                                                                                             INITIALIZE DISPLAY LU FLAG
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IF(IPTZ.EQ.I)STAB = GT + (PTEMP(I)- ALTINC + GPTE4P - PTEMP(I))/
(ALT(I) - ALTINC - ALT(I) + I.GE-7)
                                                                                                                                                                                                                                      URITE(6,1232)1,STAB,ALTINC,Z,S1,PT,PTAV
FORMAT(1X,"1,STAB,ALTINC,Z,S1,PT,PTAV"",1X,I3,6(1X,E10.8))
Zalpna = Alt(1) - Alt(1) - Altinc
                                                                                                                                                                                                                                                                                                                                                                                                                                                               - ARGUNENT OF ARC COSINE (MUST BE LESS THAN -1)
                                                                                                                                                                                                                                                                      ALPHA - ALPHAC + ZALFH9**4/(AA + ZALPHK**88 + CC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             FORMAT(1X, "I, ALPHA, STAB, C2 "", IX, I3, 3(1X, E14.8))
IF(C2 .LT. -1.0,00 TO 4
C3 = C2/SQRT(1.0 - C2 + C2)
RISTIN(1) = (PIOVR2 - ATAN(C3))/SQRT(STAB)
IF(IFLAG .E0.0) G0 TO 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FEEL .... to tiffica ....
                                                                    TERP = (ALT(1) - ALTINC - ALT(INI)) DALT
                                                                                                                                                                                                                                                                                                CALCULATE POTENTIAL TENPERATURE FACTOR
                                                                                                                                                                                                                                                                                                                                                                                                                                         CALCULATION FOR STABLE CLOUD RISE
                                                                                                                                                                                                                                                                                                                                                        CALCULATION FOR ADIABATIC RISE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CALCULATE RAHLE AND DIRECTION
                                                                                                                                                                                                                                                                                                                                                                                 .GT. 0.0006013C0 10 2
                                                                                                                                                                             - PTAV)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   URITE(6, 122)1, AL. FHA, STAB, C2
IF(ALTINC, EG. 0.0)CO TO 44
                                                                                                                                                                                                                                                                                                                                                                                             RISTIN(1) - SORT(ALPIM)
                                                                                                                                                                          811HC = (2 - 24V)*(PT
821HC = (2 - 24V)**2
                                                                                                                                                                PTAV - PTSUM./FLOATCI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ALTINC - ALTINC + 0.1
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GO TO 1
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                                                        2 = ALTCI) - ALTINC
                                             PISUM - PISUM - PT
                                                                                                                                         PTSUM - FTSUM + PT
                                                                                                                                                                                                                          STAB - GT*($1/82)
           SI = SI - 511HC
S2 = S2 - 821HC
                                                                                                                                                                                                 51 = 81 + 51 INC
82 = 52 + 52 INC
                                  2 - WOSZ - WOSZ
                                                                                                                            25UH = 29UH + 2
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در
                                                                               PT - POT-TERP
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C++* AVERAGE WIND DIRECTION... BE CAREFUL TO ADJUST FOR PROPER VECTOR DIRECTION
                                                                                                                        C*** FIND ACTUAL WIND TRANSPORT DIRCETION..AND PI FOR DELDIR <180..ELSE SUB
                                                                                                                                                                                                                                                                                                                                            URITE OUT THE VARIABLES UITH THE APPROPRIATE FORMAT STATEMENT
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IF(ALTINC .NE. 0.0XG) TO 11
CONTINUE
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                                         DELDIR - DEGRAD + (.5*(FLOAT(IDIR(I) + IDIR(INI))
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- DELDIR)
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RHGX = RNGX - STBRING + COS(PI - DALT)
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RNGX = RNGX + STBRHG + COSCPI
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(RISTINCINI) - RISTIN(1))

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PROBUCTION KUN -- IF TOPLAY IS UNDEFINED, USE LAYTOP AS ESTIMATED
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ***THE TEST FOR DETERMINING J3 AND J2 HAS BEEN ALTERED SINCE 1.0 ***AND 1000.0 ARE TOO RIGID FOR VORKABLE STANDARDS.
                                                                                                                                                                                                                                                                                                      CALL THE SUBROUTINE RSGAZ TO CALCULATE THE VALUE OF SIGAZ
                                                                                                                                                                                                                                                                                                                  HOTE THAT THE FLAG ITDU IS USED TO BRANCH WHEN TOWER DATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            URITE OUT THE ESTIMATED TOP OF SURFACE LAYER -- READ IN
                           IS THIS A RESEARCH, OPERATIONAL, OR PROPORTION FULL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF(ABSCALT(J)-304.8) .LT. ABSCALT(J3)-364.8))J3 = J
IF(ALT(J).LE.304.8 .AND. ALT(J+1).GT.304.8) J3 = J
IF(ABSCPRESS(J)-1000.0).LT. ABSCPRESS(J2)-1006.67)J2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IF( J2.NE. 0 . AND. J3.NE. 0)CALL RSGAZ( J1, J2, J3, SIGAZ)
URITE (6, 787) 9IGAZ, NAMEF, LAYTOF
FORMAT(" RSGAZ IN RCLD8 IS:", F0.4," FILE:", 3A2,"
                                                                                                                                          CALCULATE LAYTOP BASED ON VALUE OF TOPLAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            THE ONE TO BE USED -- CALCULATE LAYTOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IF(ABS(ALT(J)-304.8) .LE. 1.0)J3 = J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TOPLAY = ALTCLAYTOP)
CALL CHARC320.0, YPGS, 0, IDATAF, 6, 0, 0)
YPGS = YPGS - 32.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL LERSCYPOS, LVERSH)
CALL CHARCO.O, YPOS, O, ILINE, 64, 0,0)
CALL CODE
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IF(DIFF .GT. LEASTD)GO TO 16
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                                                                                                             IFCTOFLAY .LE. 0.050 TO
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J3 = 0
IF(ITDU.EQ.0) G0 T0 17
J1 = 1
J2 = 3
J3 = 4
                                                      IFC IRUH .LE. 23CO TO
                                                                                                                                                                    LEASTD - 9999999.9
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CALL FTOP
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#### ORIGINAL PAGE POOR QUALITY

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IF NET PLOTS ARE GNLY BEING DONE, TERMINATE EXECUTION OF RULUR
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                                                                                                                                                                                                                                                                                                                                                              IFK.NOT.LVERSN) GO TØ 20
CALL IHK2,JTYPE,463.8,YPOS,0,IDATAF,HIH,0,31,0,31,IX,IY)
IFKJTYPE .ED. 13GO TO 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C+++ WRITE TO THE PUNCH IS TEMPORAPILY DISABLED
                                                                                       CALL CHAR(0.0, YPOS,0,1L!HE,6,3,0)
CALL CHAR(56.0, YPOS,0,1L!HE(5),0)
CALL CHAR(64.0, YPOS,0,1L!HE(5),9,3,0)
CALL CHAR(160.0, YF/99.0,1L!HE(11),44,0,0)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL CHAR( 0.0, YPOS, 0, ILINE, 18, 0, 0)
CALL CHAR( 143.0, YPOS, 0, IERS, 46, 0, 0)
YPOS = YPOS - 32.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL CHAR(56.0, YPOS, 0, IERS, 10,0,0,0)
CALL CHAR(360.0, YPOS, 0, IERS, 10,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CALL CHAR(0.0, VPOS, 0, ILINE, 18, 0, 0)
CALL CHAR(47.0, VPOS, 0, IERS, 40, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CALL CHAR(47.8, YPO8, 0, IERS, 40, 0, 0)
YPOS # YPOS - 32.0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IF(TOPIN.EG. INO)STO?
IF(TOPIN.LE. TOPIX) GO TO 22
IFCIRUM GE. 25G0 TO 24
CALL DREAD(NAMEF, 3, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      READ ( 10ATAF, 101) TOPLAY
                                                              CALL LERS (YPUS, LVERSH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GO TO 15
IF(IX .GT. 9)GO TO 23
                                                                                                                                                                                                                                                                 CALL BLANK(IDATAF, 3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YPOS - YPOS - 32.8
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C0 T0 22
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FORMAT(*
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URITE GET THE TOP OF THE SURFACE LAYER AND UTHD DIRECTION
                                                                                                                                                                                                                                                                                                                                                              CALCULATE AND URITE OUT THE MEAN WIND SPEED, AVSPD, SND
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AVSPD = AVSPD + 0.5 + (SPEED(I) + SPEED(INI)) + DALT
AVDIR = AVDIR + 0.5 + FLOAT(IDIR(I) + IDIR(INI)) + DALT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               18 THIS A PESCHPER OFERATIONAL, OF PROBUCTION RIVER
                                                                                                                                                                                                                                                                   URITE (LUPRIT, 205) TOPLAY, IDIRCLAYTOP), SPEED(LAYTOP)
                                                                                                                                                                                                                                                                                                                                                                                                    DO 28 1-2,LAYTGP
IFCIABS(IDIRCI) - IDIRCI-1)) .LT. 1805G0 TO 26
DO 27 J=1,LAYTOP
                                                                                                                                                                                                                                                                                                                                                                                                                                             IF(IDIR(J) .LT. 180)IDIR(J) - IDIR(J) + 360
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      34 IF(101R(1) .GT. 360)101R(1) = 101R(1) - 360
                                                                                                                                            CALL CHAR(406.6, YPGS, 0, IDATAF, 7, 0, 0)
ALT(LAYTOP) = TOPLAY
YF09 = YPGS = 32.0
                                                                                                         CALL CHAR(0.0, YPOS, 0, ILINE, SG, 6,0)
Call code
                                                                                                                                                                                                                                                                                                                                      PRESS(1) + TOPLAY++BB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36 URITE (LUPRHT, 206) AVSFD, AVDIR
                                                                                                                                                                                                                                                                                               CALCULATE SOURCE STRENGTH
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AVDIR = AVDIR + 188.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DALT = ALTKLAYTOP) - ALTKI)
AVSPD = AVSPD/DALT
AVDIR = AVDIR/DALT
             CHANGE THE TOFLAY VALUE?
                                                                 IFCLVERSN) YPOS = 474.0
CALL DREADCHAMEF,5,ILINE)
CALL LERSCYPOS,LVERSN)
                                                                                                                                  URITE (15ATAF, 101) TOPLAY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DALT = ALT(I) - ALT(INI)
                                                                                                                                                                                                                           AND SPEED AT THE TOP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DO 34 1-1, LAYTOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DO 32 1-2, LAYTOP
                                                   YPOS = 474.0
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-- ALLOW THE CALCULATED VALUE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALCULATE THE HORIZONTAL AND VERTICAL CLUUD DIMENSIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IM( 0, JTYPE, 368. 0, YPOS, 0, IDATAF, HIH, 0, 31, 0, 31, IX, IY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               URITE OUT SIGAZ, THE SIGNA OF THE WIND AZINUTH ANGLE
                                                                                                                                                                                                                                                                                                                                                                      CALL CHAR(0.0,7P03,0,1LINE,64,0,0)
IF(IX .LE. 25)CALL CHAR(464.0,7P0S,0,IERS,6,0,0)
IF(IX .GT. 25)CALL CHAR(384.0,7P0S,0,IERS,8,0,0)
                                                                                                                                                                                                                                                                                                                                      CALL IN(1, JTYPE, 0.0, 0.0, 0, 0, 0, 31, 0, 31, 1Y)
                                                                                                              WRITE (ILIN23, 102) SIGAZ
CALL CHAR(0.0, YPOS, 0, ILINE, 43,3,0)
CALL CHAR(352.0, YPOS, 0, ILINE(23),4,0,0)
CALL CHAR(384.0, YPOS, 0, ILINE(25),8,3,0)
CALL CHAR(464.0, YPOS, 0, ILINE(25),8,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF(CLORAD+STBALT GE. ACT(LAYTUP) 1792 =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL LERS(YPOS,LVER9N)
CALL CHAR(0.0,YPOS,0,ILINE,51,3,9)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL CHAR(0.0, VPOS,0,1LINE,50,0,0)
VPOS = YPOS - 32.0
               RESEARCH OR OPERATIOHAL RUN
SIGAZ TG BE CHANSED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIGX0 = 0.297674 + STBALT
GSPEED = 0.232558 + STBALT
                                                                 CALL DREAD(NAMEF, 6, ILINE)
CALL LERS(YPOS, LVERSH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL DREAD(NAMEF, 7, 1LINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIGAP - 0.0087266 + SIGAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1.e. SIGKO AND GSPEED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                URITE (ILIN24,102) SIGAZ
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                                                                                                                                                                                                                                                                     IFCIANS . HE. 1HN > GO TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               READ (IDATAF,102) SIGAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                         IFCIX .LE. 25360 TO 45
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CALL BLANK(IDATAF,2)
                                                                                                                                                                                                                                                     IFC 1ANS. EQ. 1H0 38TOP
                                                                                                                                                                                                  IFCLVERSNY GO TO 41
                                                                                                                                                                                                                                                                                                                                                                                                                          YPGS = YPOS - 32.0
                                                                                                                                                                                                                                     READY LU, 90 STANS
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IF( IRUN .ES. 3)CO TO 45

# ODIGINAL PAGE IS

47 IF(IV2 .EQ. 1)STBHT = 0.5 + (ALT(LAYTOP) + STBALT - CLDRAD) IF(IV2 .EG. 1)51G26 = (ALTCLÁYTGF) - 5TBALT + CLDRÁD v/4;3 IF(SIG26 .GT. 0.6)G0 TG 47 STBHT = 0.5 + ALTCLAYTGP) SIG20 = 0.64 + \$TBHT/2.15 CALL THE CONCENTRATION PROGRAM RCONC TERMINATE EXECUTION OF RCLDS 49 URITE (LUPRHI, 209) STBHT CALL NGRAF CALL RUDISCHANE, 1) CALL EXECC9, RCONC) END OF RCLDS G0 T0 49 EXE EXE 1600 STGP 0545 0539 0540 6541 0542 0543 0544 6547 6548 6549 6556 6556 6553 6554 0555 0555 0556 0556 0559 0560 0561

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CLOUD STABILIZATION AND LAYER FRANKIERS
COMMON STBALT, STBALT, STBAZD, STBTH, CLDRAD, RISTINGSD), BOTLAY,
TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, 1PTZ \*KE ED3, CABB1 0815 COMMON BICKO, BICK, SIGZO, SIGAP, KDIST, YDIST, EXPZ, SGSIGZ, BICY, SIGAL, CHEATH, YPARC (6)), CHEATH, YPARC (1)), CHEATH, YPARC (2)), COMMON MLT(30), IDIR(30), SPEED(30), TENP(30), PRESS(30), PTENF(30), (PAL203, VPAP(161), (PHC, YPAP(17) ., (SAHHAZ, 9FAP(19)) OPTION PARAMETERS COMMON YPOS, YES, ISHLFO, IVHICL, IRUN, ICALC, IPLACE, ITINEZ, IGGTMP, NUMBON, LU, NUM, NOMLY, MEGRM, LUPRNT, ITOU, IPL1, IFL2, IPL3 CPHSL, YPARCES)), CPCO, YPARCES), CPCO2, VFARCES), AND URITES COMMON AREAS TO DISC EQUIVALENCE (GC), VPAR(1), (DC2, VPAR(2)), (GC3, VPAP(3)), (G11, VPAR(4)), (G12, VPAR(5)), (G13, VPAF(6)), (G13, VPAR(5)), (G2, VPAR(3)), (G2, VPAR(3)), (G3, VPAR(3)), (G3 COMMON PI, PIGVRZ, F143, TUOPI, SGR2PI, DECRAD, RADDEC, 192 COMMON LTIME, LTIM, LDAY, LMOHTM 2), LYEAR, LAUNTDG 103 EQUIVALENCE STATEMENT FOR YEHICLE PARAMETERS COMMON COMMAX, CONCPX, DOSMAX, DOSFY, RHGSMC, RINGSMD CONCENTRATION AND DOSMIE YALVES AND RANGES TO BE UTILIZED BY THE YARIOUS REED PROCRAHS. ARCLET TERRES IS ON CROSSOS USING SOLIS BLKS RESSES COMION ISTINE, ISDAY, ISHOM 2, ), 15YEAR COMMON ITIME, IDAY, INCATH(2), IYEAR CLDING, AYSFD, AVE IR, 31642 INTEGER OFFER 1441, OBIN (557) FTH4X, L. SUBROUTINE RUDISCHAME, JJ), DIFFUSION COEFFICIENTS THIS SUBRCUTINE READS COMMON VPAK 183, 81CHCL VEHICLE PARAMETERS BURFEH, FILE(3) CALCULATION TIME MATH PARAMETERS SOUNDING TIME COMMON AREAS LAMEN TIME LOGICAL LTIME INTEGER FIRE HET DATA INTEGER YES ? ~~ ? ? 222 22 2 3 ? 3 3 1999 1020 1647 3000 2000 023 122 925 1927 6623 6633 9638 9600 6937 6133 6643 8790 6643 9639 1000 2500 1653 9630 2015 977 1000 6655 9886 100 4-51

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THE SCRATCH DATA FILE (1.e. "REED2) ISH'T THEPE, CREATE IT I U A R E 11 BE SURE FILE IS PURGED BEFORE STARTING RUM 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMMON ALTGO), IDIR(30), SPEED(36), TEMP(30), PRESS(30), PTEMP(30),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMON YPOS, YES, ISHOFG, IVHICL, IRUM, ICALC, IPLACE, ITIMEZ, IGOTMP MUMRUH, LU, HUM, MOHLY, MFORM, LUPRHIT, ITOU, 1PL1, IPL2, IPL3
                                           *** ISIZE(1) * 8 BLUCKS EXPECTED TO BE WRITTER READ DURING RUNI
*** ISIZE(2) * 8 WGRDS IN THE COMMON BLOCK TO BE TRANSFERPED
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                                                                                                                                                      IFC (IERR.LT.0) .AMG, (IERR.ME,-6) ) URITEC6,778) IERR
FORMATC" ••• ATTEMFT TO OFEW, IERE =",14)
                                                                                                                                                                                                                                                                                                                                                                                                                               OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                             SURFACE LAYER BY FINDING SIGNIFICANT CHANGES IN THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  COMMON PI, PIOVEZ, FI43, TWOPI, SGR2PI, DEGRAD, RADDEG, IV2
                                                                                                                                                                                                                                                                  * REND OF WRITE, AS PER OKDER
IFCJJ.EG.INCALL WRITF(ODCB.IERR,08UF,1912E(2))
IFCJJ.EG.O.CALL RENDF(ODCB.IERR,08UF,1512E(2))
                                                                                                                                                                                                                                                                                                                                                                                                                              THIS SUBROUTINE COMPUTES THE INDEX OF THE TOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                           SLOPE OF THE WIND DIRECTION, WIND SPEED, AND TEMPERATURE VS. ALTITUDE CURVES
                                                                                                                                                                                                    CALL CREAT(OCC6, IERR, HAME, ISIZE, 3, 0, 0, 144)
IF(IERR, LE. 0) URITE(6, 759) IERR
                                                                                                                                                                                                                                 FORMATC" *** CREATE/OFEN, IERR=",14)
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DINENSION MANE(3), ISIZE(2)
                                                                                                                                    CALL OPEN COCB, IERR, IMME, 0)
              EGUIVALENCE COBUFCED, PLD
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                                                                                                                                                                                                                                                                                                                 CALL CLOSE(ODCB, IERR)
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                                                                        DATA 1812E/30,552/
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                                                                                                                                                                                                                                                                   *** REND OF URITE,
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DATA STATEMENT FOR THE SIGNIFICANT SLOPE CHANGES FOR EACH CURVE
                                                            CLOUD STARTILIZATION AND LAYER PARAMETERS
COMMON STBALT, STBHIT, STBAZD, STBRING, STBTIM, CLURAD, RISTIMC30, BOTLAY,
TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, 1P1Z
                                                                                                                                                                    COMMON SIGKO, SIGK, SIGZO, SIGAP, XBIST, YDIST, EXPZ, SOSIGZ, SIGY, SIGAL, CLDLMG, AYSPD, AVDIR, SIGAZ
                                                                                                                                                                                                                                                                                                                                                                               (HEATH, YPAR(10)), (HEATH, YPAR(11)), (HESTA, VPAR(12)),
                                                                                                                                                                                                                                                                                                                                                                                                                       (PAL 203, VPAR(16)), (PNO, VPAR(17)), (GAIMAX, VPAR(18))
                                                                                                                                                                                                                                                                                                                                                                                                    (PHCL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VFAR(15)),
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                                                                                                                                                                                                                                                                                                                 EDUIVALENCE (OC1, VPAR(1)), (OC2, VPAR(2)), (OC3, VFAP(3)), (OT1, VPAR(4)), (OT2, VPAR(5)), (OT3, VPAR(5)),
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BURFACE LAYER WILL HEVER BE ALLOWES TO BE BELOW THE
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COMMON LTINE,LTIN,LDAY,LMONTHC2),LYEAR,LAMITO(16)
                                                                                                                                                                                                                                                                                       EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS
                                                                                                                                                                                                                                                   COMMON COMMAK, COINTRY, DOSMAK, DOSFK, KIIGSHC, RIK, SHD
                                                                                                                                                                                                                                CONCENTRATION AND DUSAGE VALUES AND RANGES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DATA WDSLD/0.030/, WSSLD/0.015/, DTSLD/0.015/
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DELD = FLOAT(ITMETCI+I) - ITMET(I))
SLOFE2 = DELD/(ALT(I+I) - ALT(I))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DELD * FLOAT(17HET(2) - 17HET(1))
SLOPE2 * DELD/(ALT(2) - ALT(1))
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CALCULATE AND STORE THE THOUGH THE STRUITLEART SLOPE CHANGES OF THE WIND SPEED VS. ALTITHUS CYPHE

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IF THERE IS ONLY ONE SIGNIFICANT SLOPE CHANGE, MAKE IT THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SORT THE SIGNIFICANT SLOPE CHANGE POINTS FROM HIGH TO LOW
                                                                                                                                CALCULATE AND STORE THE INDEX FOR THE SIGNIFICANT SLUPE
                                                                                                                                                                                                                                                                                                       IF THERE ARE NO SIGNIFICANT SLOPE CHANGES, MAKE THE TOP OF THE LAYER TWICE THE CLOUD STABILIZATION ALTITUDE
                      9LGPE1 = $LGFE2
$LOPE2 = ($PEED(1+1) - $PEED(1))/<ALT(1+1) - ALT(1))
IF(ALT(1) .LT. CLDBGT)GO TO 6
$LDIF = ABS($LGPE2 - $LUPE1)
IF($LDIF .LT. W$$LDJGO TO 6
MPT = NPT + 1
                                                                                                                                            CHANGES OF THE DRY TEMPERATURE YS. ALTITUDE CURVE
                                                                                                                                                                                                        SLOPE2 - (TEMP(1+1) - TEMP(1))/(ALT(1+1) - ALT(1))
SLGFE2 - (8FEED(2) - SPEED(1))/(ALT(2) - ALT(1))
                                                                                                                                                                    SLOPE2 = (TEMP(2) - TEMP(1))/(ALT(2) - ALT(1))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               JJ = NPT - 1

DO 18 J=1, JJ

JI = J + 1

IF(IPT(J) .GE. IPT(JI))GO TO 18
                                                                                                                                                                                                                      IFCALTCID LIT. CLDB0TDG0 TO 9
                                                                                                                                                                                                                                 SLDIF = AB6(SLOFEZ - SLOPE)
IF(SLDIF LT, DTSLD)CO TO 9
                                                                                                                                                                                                                                                                                                                                                                           DO 12 1=1, HUM
DIF = 468(ALT(1) - STBAL2)
1F(DIF .GE, DIFHIH)GO TO 12
DIFHIH = DIF
LAYTOP = 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         10P OF THE SURFACE LAYER
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            DO 6 1=2, NUM1
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                                                                                               IPT(MPT) = I
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COMMON ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30), CURVES AT THE SAME POINT -- HEXT CHECK FOR SIGNIFICANT SLOPE CHANGES FROM TWO OUT OF THE THREE CURVES AT THE SAME POINT -- THE FIRST POINT MEETING ONE OF THESE REQUIREMENTS MILL BE THE TOP OF THE SURFACE LAYER COMMON YPOS, YES, ISHOFO, IVHICL, IRUN, ICALC, IPLACE, ITINEZ, 1GOTHP, NUMRUN, LU, NUM, MONLY, MFORM, LUFRNT, ITDU, IPLI, IPL2, IPL3 THERE ARE NO DUPLICATE POINTS OF SIGNIFICANT SLOPE CHANGE, Make the top of the surface layer the first point FIRST CHECK FOR SIGHIFICANT SLOPE CHANGES FROM ALL THREE THIS SUBROUTINE ALLOUS THE USER TO CHOOSE THE TOP OF THE SURFACE LAYER BY URITING SIGNIFICANT CHANGES IN THE SLOPE OF THE WIND DIRECTION, WIND SPEED, AND DRY
TEMPERATURE VS. ALTITUDE CURVES TO THE CRT OR PLASMASCOPE-COMMON PI, PIOVR2, PI43, TWOPI, SAR2PI, DEGRAD, RADDEG, IV2 JI = 1 DO 25 J=2,1WT IF(IPT(J) .EQ. IPT(J-15)GO 10 22 JI = 1 JJ)G0 T0 25 COMMON VPAR( 18), SIGHCL VEHICLE PARAMETERS SUPPEH, FILE(3) OPTION PARAMETERS CALCINIATION TIME MATH PARAMETERS SUBROUTINE PTTOP 1FC JI .HE. JJ)G( LAYTOP = 1PTCJ) LAYTOP = IPT(1) CONNOH AREAS END OF FTOP INTEGER FILE G0 T0 25 JI - JI + 1 INTEGER YES HET DATA CONTINUE RETURN RETURN ? ? ? ? ^^ 25 22 000000 0000 ပ ن ن ں ن 0243 0256 259 1250 1252 0253 1255 0257 9529 1260 1563 9267 0268 0269 0270 1247 3248 3562 9279 282 0205 1288 0273 1278 128 1283 0286 978 1290 0292 0293 1221 1274 ú291 0294 0295 6536 251 261 281 4-55 ٦ ١

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CLOUD STABILIZATION AND LAYER PARAMETERS COMMON STBALT, STBHT, STBTIM, CLORAD, RISTIM(30), BOTLAY, TOPLAY, CALHT, LAYTOF, LAYBOT, REFLEC, 1PTZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DATA STATEMENT FOR THE SIGNIFICANT SLOPE CHANGES FOR EACH CURVE
                                                                                                                                                                                                                             COMMON SIGKO, SIGK, SIGZO, SIGAP, KDIST, YDIST, EXPZ, SGSIGZ, SIGY, SIGAL,
Clding, avspd, avdir, sigaz
                                                                                                                                                                                                                                                                                                                                                                             (AA, VPAR(7)), (BB, VPAR(8)), (CC, VPAR(9)),
(HEATH, VPAR(10)), (HEATH, VPAR(11)), (HEATA, VPAR(12)),
(PHCL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VFAR(15)),
                                                                                                                                                                                                                                                                                                                                                                                                                               (PAL203, VPAR(16)), (PNO, VPAR(17)), (GAMMAX, VFAR(18))
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                                                                                                                                                                                                                                                                                                                                               EQUIVALENCE (QC1, VPAK(1)), (QC2, VPAK(2)), (QC3, VFAK(3)), (Q11, VPAK(4)), (Q12, VPAK(5)), (Q13, VPAK(6)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DIMENSION IPTC 40 >, DWDSC 40 >, USDSC 40 >, ITHETC 40 >, DSTARC 30 >, SSTARC 30 >, TSTARC 30 >
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CHANGES OF THE WIND DIRECTION VS. ALTITUDE CURVE
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                                                                         . LAUNCH TIME,
COMMON LTIME,LTIM,LDAY,LMONTH(2),LYEAR,LAUHFD(10)
LOGICAL LTIME
                                                                                                                                                                                                                                                                                CONCENTRATION AND DOSAGE VALUES AND RANGES COMMON COMMAX, CONCPK, DOSMAX, DOSFK, RIGSHC, RIGSHD
                                                                                                                                                                                                                                                                                                                                EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DATA UDSLD/0.630/, USSLD/0.015/, DTSLD/0.015/
                                               COMMON 19TIME, 15DAY, 18MOIK 2), 15YEAR
CONMON ITIME, IDAY, INGNTH(2), IYEAR
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                               SOUMDING TIME
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CALCULATE AND STORE THE INDEX FOR THE SIGNIFICANT SLOPE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TOP OF THE LAYER TUICE THE CLOUP STARTLIZATION ALTHUR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9LOPE: = 9LOPE2
SLOPE2 = (TEMP(1+1) - TEMP(1))/(ALT(1+1) - ALT(1))
IF(ALT(1) .LT. CLUBOT .OR, ALT(1) .GT. STRAL2) GO TO
9LDIF = (SLOPE2 - SLOPE1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SLOPE: = SLOPE2
SLOPE2 = (SPEED(1+1) - SPEED(1))/(ALT(1+1) - ALT(1))
IF(ALT(1) .LT. CLUBOT .OR. ALT(1) .GT. STBAL2) GO TO
                                                                                                                                                                                                                                                                        IF(ALT(1) .LT. CL080T .0R. ALT(1) .GT. STBAL2) G0 T0
                                                                                                                                                                                                                                                                                        SLDIF = (SLOPE2 - SLOPE)

IF(ABS(SLDIF).LT. 0.01)GO TO 3

IF(SLOPE2.GT.0.0.AND.SLOPE1.LT.0.0) DSTAR(!) = SLDIF

IF(SLOPE1.GT.0.0.AND.SLOPE2.LT.0.0) DSTAR(!) = SLDIF

HPT = HPT + 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALCULATE AND STORE THE INDEX FOR THE SIGHIFICANT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF<SLOPE1.GT.0.0.AND.SLOPE2.LT.0.0) SSTAR<1) = SLDIF
IF<SLOPE2.GT.0.0.AND.SLOPE1.LT.0.0) SSTAR<1) = SLDIF
USDS<1) = GLDIF
HPT = HPT + ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF(ABS/SLDIF) .LT. 0.01)G0 TO 9
IF(SLOPE).GT.0.0,AMD.SLOPE2.LT.0.0) TSTAR(I) = SLDIF
IF(SLOPE2.GT.0.0,AMD.SLOPE1.LT.0.0) TSTAR(I) = SLDIF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9LOPE2 - (SPEED(2) - SPEED(1))/(ALT(2) - ALT(1))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CHANGES OF THE WIND SPEED VS. ALTITUDE CURVE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SLGPE2 = (TEMP(2) - TEMP(1))/(ALT(2) - ALT(1))
                                                                                                                                                                      8LOPE1 = $LOPE2
DELD = FLOAT(INET(I+1) - ITHET(I))
IF(DELD.GT.180.) DELD = 360. - DELD
IF(DELD.LT.-180.) DELD = -360. - DELD
$LOPE2 = DELD/(ALT(I+1) - ALT(I))
                                    NUM1 = NUM - 1
DELD = FLOAK(ITMETC2) - ITMET(1))
IF(DELD,GT,100.) DELD = 360, - DELD
IF(DELD,LT,-180.) DELD = -360, - DELD
                                                                                                                SLOPE2 - DELD/(ALT(2) - ALT(1))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SLDIF = (SLOPE2 - SLOPE)
IF(ABS(SLDIF),LT. 0.001)G0 TO 6
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101 FORMAT(* OMLY GME SIGNIFICANT SLOPE CHANGE, THE TOP OF THE LAYER*
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TENPERATURE"/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TEHPERATURE",
                                                                                                                                                                         IF THERE IS ONLY ONE SIGNIFICANT SLOPE CHANGE, MAKE IT THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   C URITE TO THE USER THE ALTITUDES HAVING SIGNIFICANT SLOPE CHANGES
C
                                                                                                                                                                                                                                                                                                              SORT THE SIGNIFICANT SLOPE CHANGE POINTS FROM HIGH TO LOW
                                                                                                        URITE (LU,100) ALT(LAYTOP)
100 FORMAT(" NO BIGNIFICANT SLOPE CHANGES, THE TOP OF THE LAYER
. "IS",F16.2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           = :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           UIND SPEED 1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF(ALT(K),LT.CLDBOT.OR.ALT(K),GT.STBAL2) GO TO 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          <u>۔</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IFCDUDSCK).GT.1000.) DUDSCK) = 99.9999
IFCUSDSCK).GT.1000.) USDSCK) = 99.9999
IFCTDSCK).GT.1000.) TDSCK) = 99.9999
IFCTDSCK).HE.0.0) GO TO 37
IFCUSDSCK).HE.0.3) GO TO 37
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                                                                                                                                                                                                                                                                                                                                                   20 19 1=1, HPT1

21 = MPT - 1

10 18 1=1, JJ

J1 = J + 1

IF(IPT(J), GE, IPT(J1))GO TO 18

K = IPT(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                C++ URITE THE HEADER TO THE PRINTER
                                                    IF(DIF GE. DIFMIN)GO TO 12
                                                                                                                                                                                      TOP OF THE SURFACE LAYER
                       DO 12 1=1, HUM
DIF = ABS(ALT(1) - STBAL2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LAN V SLOPE"
                                                                                                                                                                                                                                           URITE (LU, 101) ALT(LAYTOP)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           JECTDSCK), E0.0, 60 G0 T0 33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SLOPE DIFF")
 .CT. 0>CO TO 14
                                                                                                                                                                                                                  .GT. 1360 TO 16
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.WRITE (LU, 105) K, ALT(K), GWDS(K), ISTR, WSDS(K), ISTR, TDS(K), ISTR IF(LSTAR(K), HE. 0. 0, AND. SSTAR(K), EQ. 0. 0.
WRITE (LU, 106) K, ALT(K), GWDS(K), ISTR, WSDS(K), TDS(K)
IF(DSTAR(K), EQ. 0. 0, AND. SSTAR(K), HE. 0. 0, AND. TSTAR(K), EQ. 0. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 111 FORMAT(" LLGJ ENTER THE MUMBER OF THE LAYER FOR THE TOP CLAG"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      .URITE (6,105) K,ALT(K),DUDS(K),ISTR,USDS(K),ISTR,TDS(K),ISTR
IF(DSTAR(K).NE.0.0.AND.SSTAR(K).EQ.0.0.AHD.TSTAR(K).EQ.0.0)
.Urite (6,106) K,ALT(K),DUDS(K),ISTR,USDS(K),TDS(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF(DRIAR(K).NE.0.0.AND.SSTAR(K).EU.0.0.AND.TSTAR(K).NE.0.0)
URITE (6,110) K,ALT(K),DUDS(K),ISTR,USDS(K),TDS(K),ISTR
FORMAT(16,F0.1,F12.5,2(F13.5))
                                                                                    IF(DSTARKK). NE. O. U. AHD. SSTARKK). NE. O. O. AHD. TSTARKK). NE. 6. 0)
                                                                                                                                                                                                                                                                            WELLE (LU, 107) K, ALT(K), DUDS(K), USFS(K), ISTR, TDS(K)
IF(DSTARK), EQ. 0. 0. AID, SSTAR(K), EQ. 0. 0. AID, TSTAR(K). HE. 0. 0.
                                                                                                                                                                                                                                                                                                                                                                                          IF(USTARKK), EQ. 0. 0. AND, SSTARKK), HE. 0. 0. AND, TSTARKK), NE. 0. 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF(DSTAR(K), HE. B. B. AND. SSTAR(K). EQ. B. B. AHD. TSTAR(K). HE. B. B)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1F(D8TAR(K), NE. 0.0.AND.88TAR(K).NE.0.0, AND.TSTAR(K).NE.0.0)
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      IF(DSTAR(K), NE. B. C. AHD, SSTAR(K), HE. B. C. AHD, TSTAR(K), EQ. C. 6)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IF(D8TAR(K),EQ.0.0.AND.8STAR(K),EQ.0.0.AND.1STAR(K).EQ.0.0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IF(D9TAR(K).NE.O.O.AHD.SSTAR(K).HE.O.G.AHD.TSTAR(K).EG.O.O
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF(D81AR(K), EQ. 0.0.AM).SSTAR(K).HE.0.0.AHD.TSTAR(K).EQ.0.0.
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                                          URITE (LU, 104) K, ALTCK), DWDSCK), ISTR, WSDSCK), ISTR, TISCK)
                                                                                                                                                                                                                                                                                                                                                                                                                                           WRITE (LU, 109) K, ALT(K), DWDS(K), WSDS(K), 1STR, TDS(K), 1STR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WRITE (LU, 110) K, ALT(K), DUDS(K), ISTR, WSDS(K), TDS(K), ISTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  URITE (6,104) K, ALTCK), DUDSCK), 18TR, USDSCK), 1STR, TDSCK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             URITE (6,189) K, ALTKK), DUBSKK), USBSKK), ISTR, TDSKK), STR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     URITE (6,107) K, ALT(K), DUDS(K), USDS(K), ISTR, TDS(K)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WRITE (6,108) K, ALT(K), DUDS(K), USFS(K), TDS(K), ISTR
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FORMAT(16,FB.1,F12.5,A1,F11.5,A1,F11.3,A1)
FORMAT(16,FB.1,F12.5,A1,F12.5,F13.5)
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(LU, 183) K, ALT(K), DUDS(K), USDS(K), TDS(K)

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SUBROUTINE DREAD(NAMEF, LHUM, ILINE)

END OF PTTOP

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#### PAGE 15 POOR QUALITY

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1 i
THIS SUBROUTINE READS A SPECIFIED QUESTION FROM A SFECIFIED QUESTION FILE. THE QUESTION IS THEN DISPLAYED UPON THE PLASMASCOPE FOR PROCESSING.
                                                                                                                                                                                                                                                                                                                                                                                   THIS SUBROUTINE FILLS A SPECIFIED ARRAY WITH A SPECIFIED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   THIS SUBROUTINE ERASES A SPECIFIED LINE OF 64-CHARACTERS FROM THE PLASMASCOPE.
                                                                                   DIMENSION NAMER (3), IDCBC 144), IBUFC 40), ILINE (32)
                                                                                               CALL OPEN(10CB,1ERR,HANEF,0)
IF(1ERR .LE. 0) URITE(6,799) IERR, HANEF
FORMAT(" ERROR ",15, " ON FILE ",3A2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CALL CHAR(0.0, YPOS, 0, IERS, 64, 0,0)
CALL CHAR(0.0, YPOS-16.0,0, %ERS, 64,0,0)
                                                                                                                                                                                                                                                        READ (18UF, 100) (11.1HE(1), 1-1,32)
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                                                                                                                                                     DG 18 1=1, LOGP
CALL BLAHK(IBUF, 40)
CALL REAPF(IDCB, IERR, IBUF)
                                                                                                                                                                                                               CALL BLANK(IBUF, 40)
CALL READF(IDCB, IERR, IBUF)
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IFCYPOS .GT. 48.03GO TO 4
YPOS = 458.0
CALL CLEAR
                                                                                                                                                                                                                                                                                                                              SUBROUTINE BLANK( IBUF, 11)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SUBROUTINE LERS(YPOS)
                                                                                                                                                                                                                                                                                   CALL CLOSE(IDCB, IERK)
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                                                                                                                                         LG0P - LNUM - 1
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                                                                                                                                                                                                                                                                      FORMAT(32A2)
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CLOUD STABILIZATION AND LAYER PARAMETERS
COMMON STBALT, STBHIT, STBAZD, STBRMG, STBTIM, CLDRAD, RISTIM(30), BOTLAY,
TOPLAY, CALMI, LAYTOP, LAYBOT, REFLEC, 1PTZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMMON 91GK0,S1GK,S1GZ0,S1GAP,XD1ST,YD1ST,EXPZ,SQS1GZ,S1GY,S1GAL,
CLDLNG,AVSPD,AVD1R,S1GAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMMON ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30),
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DATA C1, C2, C3, C4, C5, C6, -. 008, -. 00175, . 0048, . 56864522, . 1132,
                                                                                                                                                                                                                                                                                                                                                                                                                                                     *0S, YES, ISMDFO, IVHICL, IRUM, ICALC, IPLACE, ITINEZ, IGOTMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             "W, LU, NUM, MOMLY, HFORM, LUPRNT, 1TDU, IPL1, IPL2, IPL3
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                                                                                                                                                                                                                                                                                         COMMON PI, PIOVR2, PI43, TWOPI, SQR2PI, DEGRAD, RADDEG, IV2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (AM, VPAR(7)), (88, VPAR(8)), (CC, VPAR(9)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMON LTIME, LTIM, LDAY, LMONTH(2), LYEAR, LAUNTD(10)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONNON COMMAX, CONCPK, DOSNAX, DOSPK, RHGSHC, RHGSHD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EDUIVALENCE STATEMENT FOR VEHICLE PARAMETERS
THIS SUBROUTINE CALCULATES A SIGNA VALUE GIVEN
                     ALTITUDE, SPEED, TEMP, AND PRESSURE FUR THE FIRST LEVEL OF DATA, THE 1000FT LEVEL OF DATA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONCENTRATION AND DOSAGE VALUES AND RANGES
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C REPITORS OF SIGAR
C NEWTON NETWOOF FOR SOLUTION OF FOR, N, D > 0
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COMMON 18TIME, 19DAY, ISHOIK 2), ISVEAR
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                                                                       MID THE 1000MB LEVEL OF DATA
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                                                                                                                                                                                                                                                                                                                                                                       COMMON VPAR( 18), SICHCL
                                                                                                                                                                                                                                                                                                                                               VEHICLE PARAMETERS
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                                                                                                                                                                                    COMMON AREAS
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CALCULATE GEÖNETRIC MEAH HEIGHT, AVERAGE THETA, AYEPAGE HEIGHT
                                                                                                                                                                                                                                                                                           IF TOUER DATA IS NOT BEING USED, INTERPOLATE TO FIND THE 1808
                         FP(X,D) =(-X++4-1,)/(0,*X++3+(ALOG(D)+C4-2,*ALOG(1,+X)
- ALOG(1,+X++2)+2,*ATAM(X))+*2) + (1,-X++4)/(2,*(1,+X)
+(1,+X++2)*(ALOG(D)+C4-2,*ALOG(1,+X)+ALOG(1,+X++2)+
F(X,B,D) =(1,-X++4)/(16,+X++2+(ALOG(D)+C4-2,+ALOG(1,+X)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C+++ E IS A CONSTANT INCORPORATING VON KARMAN'S CONSTANT AND C+++ ALSO CONVERTS FROM RADIANS TO DEGREES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        P23 = PRESS(J3) + FAC+(PRESS(J3+1)-PRESS(J3))
                                                                                                                                                                                                                                                                                                                                                                                                                                 C = (304.0 - ALY(J3))/(ALY(J5+1)-ALY(J3))
= ALY(J3)+(FAC+(ALY(J3+1)-ALY(J3)))
= TEMP(J3) + FAC+(TEMP(J3+1)-TEMP(J3))
           - ALOG(1.+X++2)+2.+ATAN(X))++2) - B
                                                                                                                                                                                                                                                                                                                                                                           WRITE (6,613) PZI,PZ2,PZ3
FORMATC" PRESSURES ARE:",3F10.2)
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                                                                                             REPD IST DATA LEVEL
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                                                                  2. *ATAH(X))**3)
                                                                                                                                                                 - PRESS(JI)
                                                                                                                                                                                                                                                                                                                                                               PZ3 - PRESS( J3)
                                                                                                                                                                                                                                                                PZZ - PRESS(JZ)
                                                                                                                       - ALT(JI)
- SPEED(JI)
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                                                                                                                                                                                                                                     SPEED( J2)
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                                                                                                                                                  - TEMP(JI)
                                                                                                                                                                                                                                                   - TEMP(J2)
                                                                                                                                                                                                                                                                                                                                                 13 = TEMP( J3)
                                                                                                                                                                                                                        - ALT( J2)
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IF(USAV.LT.6..AMD.U.GT.8..OR.USAV.GT.8..AND.U.LT.9.) GO TO 21
                                                                                                          DZTHET = ((Z1-ZA)*(THETA1-THÉTA)*(Z2-ZA)*(THETA2-THETAA)
+(Z3-ZA)*(THETA3-THETAA)/((Z1-ZA)**2 + (Z2-ZA)**2
+(Z3-ZA)**2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      U
C*** FOR STABLE CONDITIONS, USE EAGATION (314) IN PEPORT 2923 TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ASSIGN THE CORRECT F(B) FOR EACH VALUE OF B ACCORDING TO TABLE 6 IN REPORT 2923
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 - 2020 +C4-2.+ALDG(1,+R1)-ALDG(1,+R1++2)+2.+ATMI(R1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTE SIGR ACCORDING TO EQUATION 1 IN REPORT 2923 FOR
                                                                                                                                                                                                                                                                                                      C+++ USE NEWTOH'S METHOD TO SOLVE EQUATION 14 (REPORT 2923)
                                                                               CALCULATE VERTICAL GRADIENT OF POTENTIAL TEMPERATURE
                          INETAN = (THETAL + THETA2 + THETA3)/3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1F(B.LT.C1) RSIG = E+2.7/A
1F(B.GE.C/.AHD.B.LT.C2) GO TO 23
1F(B.GE.C2) GO TO 24
                                                                                                                                                                  CALCULATE B, THE STABILITY RATIO
B.LT.O = UNSTABLE
B.GT.O = STABLE
IHETA3 - 13+((1000./PZ3)++,288)
                                                                                                                                                                                                                                                                                                                                                                                                      IF(ABS(R1-R),LT.1.E-7) GO TO 21
                                                                                                                                                                                                                        # 9.8+D2THET+2+42/(T+V++2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALCULATE RICHARDSON NUMBER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 = 2.7 + 112.*(-01 + 8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FB3 = 3.4 - 725.5*(-C2 +B)
                                                                                                                                                                                                                                                                                                                                                             DO 3 I = 1,50
Rt = R - F(R,B,D)/FP(R,D)
                                                                                                                                                                                                                                                                RSIG = 48.816/ALOG(D)
                                                                                                                                                                                                                                                                                                                                                                                                                  IF(1,EQ.49) USAV = U
IF(1,HE.50) GO TO 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RII = (1.-RI++4)/16.
                                                                                                                                                                                                                                    IF(B.LT.0) GO TO 2
IF(B.GT.0) GO TO 6
             ZA # (21+22+23)/3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     UNSTABLE COMPITIONS
                                                       2020 - ALOG(D)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RSIG - E+FB2/A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RSIG - E+FB3/A
                                                                                                                                                                                                                                                                                                                                                                                        U-F(R1, B, D)
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RSIG = 30.
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ASSIGN APPROPRIATE VALUE OF FB ACCORDING TO TABLE 6 IN REPORT 2923
                                                                                                                                                                                                                                                                                                                                             C+++ FIND RGIG FROM EQUATION ! IN REPORT 2923 FOR STABLE CONDITIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ASSIGN PROPER VALUE OF FIG ACCORDING TO TABLE 6 111 REPORT 2923
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FIND THE RICHARDSON NUMBER USING EQUATION 2(A) FOR UNSTABLE CONDITIONS
                                                                                                                                                                                                                                                                                                                                                                                                                                                         FB4 = 1.55 + 38.04+(B - .0008)

FB5 = 2.35 + 5.43+(B - C?)

RSIG = (E+FB4)/(2020 - 7.+RI3/)

IF(B.GE.C?)RSIG = (E+FB5)/(2020 - 7.+RI3/)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IF(B,GE,C7)RSIG = (E+FB5)/(2020 - 7,+R14/(1, -7,+R14))
                                                                                              CHECK SIGN OF THE RADICAL, USE VALUE OF RSGIG . 30. FOR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RSIG = (E+FB4)/(2020 - 7.+R14/(1, - 7.*P14))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FB3 = 3.4 - 725.5*(-C2+B)
PSIG = (E+FB3)/(2020 - 7.*PI4/(1. - 7.*RI4))
                                                                                                                                                                                                                                                                                                                                                                                             - 7.+RI3))
                                                                                                             INACIMARY VALUES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11 SKI 4. 112. LJ. Alle. W. LT. C. 1 KS 16 - JIGPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      !F(RI3.GE.CS.AND.B.LT.C7)R91G = 81GR2!
IF(RI3.GE.C5.AND.B.GE.C7)R91G = 81GR22
                                                                                                                                                                                                                                                                                                                                                                          FB3 = 3,4 - 725,5e(-C2 + B)
RSIG = (E/ ·83)/(2020 - 7, •RI3/(1_
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        REI = (-A2 + SORT(RAD))/(2.+AI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FE4 = 1.55 + 38.04+(B - .0008)
FB5 = 2.35 + 5.43+(B - C?)
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8IGR22 = (E*F85)/(C6 + 2020)
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                                                               KAD . A2**2 - 4, *A1*A3
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COMMON STBALT, STBMT, STBAZD, BTBRNG, STBTIM, CLDRAP, RISTIM(30), BOTLAY TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, 1PTZ
                                       COMMON SIGKO, SIGK, SIGZO, SIGAP, KDIST, YDIST, EKFZ, SGSIGZ, SIGY, SIGAL,
                   *CAB, 81 0813
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (HEATH, YPAR(10)), (HEATH, YPAR(11)), (HEATA, VPAR(12)),
                                                                                                                                                                                                                                                                                                                                                                                                                           CONHOH ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (PAL 203, VPAR(16)) (PHG, VPAR(17)), (GAMMAX, VPAR(18))
                                                                                                                                                                                                                                                                                                                             COMMON YPO8, YES, 1916/FO, 1VHICL, 1RUN, 1CALC, 7PLACE, 1TIMEZ, 1GOTMP
                                                                          THIS PROGRAM GENERATES A METEORLOGICAL PROFILE OF A SOUNDING
                                                                                                                                                                                                                                                                                                                                             HUMRUN, LU, NUM, HOILLY, MFORM, LUPRNT, ITOU, IPL1, IPL2, IPL3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (PHCL, VPAR(13)), (PCO, VPAP(14)), (PCO2, VPAR(15)),
                                                                                            UPON THE PLASMASCOPE WITH THE EFFECTIVE CLOUD HEIGHT DRAWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EQUIVALENCE (GC1, VPAR(1)), (GC2, VPAR(2)), (GC3, VPAR(3)), (G11, VPAR(4)), (G12, VPAR(5)), (G13, VPAR(6)),
                                                                                                               AS AN ELLIPSE JUST BELOW THE TOP OF THE SURFACE LAYER.
                                                                                                                                                                                                        COMMON PI, PIOVEZ, F143, TWOPI, SQR2PI, DEGRAD, RANGE, IV2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CAA, VPAR(2)), (BB, VPAR(B)), (CC, VPAR(9)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONMON LTINE, LTIN, LDAY, LHONTH(2), LYZAR, LAUNTD(10)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMON CONMAX, CONCPK, DOSMAX, POSPK, RNGSNC, RNGSND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EQUIVALENCE STATEMENT FOR YEHICLE PARAMETERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONCENTRATION AND DOSAGE VALUES AND RANGES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLOUD STABILIZATION AND LAYER PARAMETERS
                 PROGRAM RNIPS(3), REVISED MET PLOT PROG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONMON 19TIME, 15DAY, ISNOW 2), 18YEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMMON ITIME, IDAY, INGNTH(2), IYEAR
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                                                                                                                                                                                                                                                VEHICLE PARAMETERS
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                                                                                                                                                                                                                                                                                                           OPTION PAKANETERS
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#### ORIGINAL PAGE POOR QUALITY

ICRV(4), 19TL(12), XWD(18)
IVDL(18,4), 19TL(12), 1VDL2(18), 1VDL3(18), 1VDL4(18)
INFT(2), 1WSTAL(2,2), 18TAB(4), 1TOP(2), 18DT(2), 1ALFHA(6),
NAME(3), 1STGMA(3), XELL(100), YELL(100), HAFIL(5) , 2HTE, 2HMP, 2H(D, 2HEG, 2H , affectively , 2000, DATA INSZENUI, 2HNND, 2H 9, 20175, 2456, 24 4, 2HNZ, 2H53Z BATA INDZENUI, 2HNND, 2018, 23152, 2HTT, 2HOH, 24 4, 2115E, 2HG3Z DATA ISURT/ZHSU, 2HAE, 2HAE, 2H 7, 2H 7, 2H 72H 7, 2HH 7, 2 , 2H! 8, 2H¢ , 2H27, 2H0 ,2H36,2H0 DATA XWD/WBB.,WBB.,W2B.,W2B.,W4B.,W4B.,W6B.,W6B.,WBB.,WBB., DATA IHARD/2HMA,2HRD,2H C,2H0P,2HY ,2HDE,2HSI,2HRE,2HD7,2H 2H ,2HYE,2HB ,2H ,2HH0/ DATA RMETG/2HRH,2HTG,1H2/ ,2H90,2H , 2HTE, 2HMP, 2HER, 2HAT, 2HUR, 2HE , 2HKD, 2HEG, DATA 1P1/2HP0, 2NTE, 2HHT, 2HTA, 2HL , 2NTE, 2HMP, 2H (, 2HDE, 2HG DIMENSION USX 30, DTX(30), PTX(30), UDX(30), CURVEY.30)
DIMENSION MAX(3), YAX(3), KCD(3), YCD(3), IFOUR(2)
DIMENSION IALTL(6), TBURK(20), BSURK(10)
DIMENSION IALTCH(336), INARD(16)
DIMENSION IALTCH(336), INARD(16)
DIMENSION IALTCH(2), ITHUN(22), IALTCH(8), IDIM(18)
DIMENSION ADDIT(2), ITHUN(22), IALTCH(8), IDIM(10)
DIMENSION KL(2), YL(2), IDIT(12), IPT(11), IMS(8), IMD(10)
DIMENSION ISURI(22), ISURI(16), IALTCH(8)
DIMENSION ICRVT(4), ISTL(12), XMD(18)
DIMENSION ICRVT(4), ISTL(12), XMD(18) EQUIVALENCE (IMDL/(1), IMDL((1, 1)), (IMDL2(1), IMDL((1, 2)), (IMDL3(1), IMDL((1, 3)), (IMDL4(1), IMDL((1, 4)) DATA 18TL/2HSP, 2HEE, 2HD(, 2HM/, 2H9), 2H ,2H ,2H M, DATA 19URL 1/2HBU, 2HRF, 2HAC, 2HE, , 2H , 2H , 2HPR, 2HEB, 2HRE, 2HRE, EQUIVALENCE STATEMENT ,2H AND DIMENSION STATEMENTS DATA ICRVT/2HV8, 2HDT, 2HPT, 2HVD/ 1WOL3/2H18,2H6,2H ,2H DATA 1VDL4/2H27,2H0 ,2H ,2H DATA HAME/2H-R, 2HEE, 2HD2/ DATA INDLIZH 0,2H DATA JUDI.2/2H90,2H DATA STATEMENTS CATA INIMUS/IH-/ **IEXP3/2H3** 2003 FORMAT (F4.1) 2002 FORMAT (F6.1) DINENSION INTEGER 2HC )/ DATA DATA 000 94 860 £900 0064 9900 8900 6900 0.000 0072 6113 0000 6299 0000 0082 1003 0685 9800 880 683 9690 669 0010 11 83 1900 1200 1200 1000 1884 192 669 96 197 2200 169 4-67

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CALL SUBROUTINE GRAF TO INITIALIZE GRAPHIC HOPE ON PLASHASCOPE
                                                                                                                   B9URX/108.0,166 0,182.5,242.5,265.0,325.0,347.5,407.5,430.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2+48,378,2+48,3+0,5+48,3+0,218,128,378,126,218,3+0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                           AN ALTERNATE CHARACTER SET (5 BY 6 RASTER UNITS IN SIZE)
                                                                                                                                                                                                                                                                                                                                                                                                                                          THE FOLLOWING DATA STATEMENT CONTAINS OCTAL REPRESENTATION
                                                                            DATA TSURX/168.,130.,146.,170.,180.,210.,226.,250.,260.,290.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IB,28,46,108,208,3+0,0,366,418,5+0,0,418,365,5+0/
ISURTI/2H8U,2HRF,2HAC,2HE,2H,2HTO,2HP,2HLA,2HYE,2HR
2H,2HGO,2HT,2HKA,2HYE,2HR/
IDATL/2HOA,2HEC,ITIML/2HTI,2HME/
IATL/2HOA,2H L,2H T,2H I,2H U,2H E/
                                                                                                                                                   DATA 170P/2H 1,2H0P/, 1801/2H 8,2H01/
DATA 1XHUM/2H10,2H-5,2H 0,2H 5,2H10,2H15,2H20,2H25,2H30,2H35
                                                                                                                                                                                                                                             DATA IYNUM/2H ,2H 0,2H 4,2H00,2H30,2H00,2H36,2H00,2H40,2H00/
12H20,2H00,2H24,2H00,2H26,2H00,2H32,2H00,2H36,2H00,2H00/
DATA IDIH/2H16,2H00,2H12,2H00,2H 8,2H00,2H 4,2H00,2H ,2H0 ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     608,108,178,168,608,3+0,418,438,458,518,618,3+0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FOLLOWS: 0-9, A-Z, AND SPECIAL CHARACTERS +,-,+,/,4,)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 768,18,368,18,768,3*0,618,128,048,128,618,3*0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 778, 148, 228, 418, 4+0, 778, 18, 18, 18, 14+0, 778, 208, 108, 208, 778, 3+0, 778, 365, 65, 778, 4+0, 365, 418, 428, 358, 4+0, 775, 448, 448, 305, 4+0, 348, 428, 358, 4+0, 775, 448, 465, 315, 4+0, 228, 518, 458, 228, 4+0, 408, 408, 778, 418, 408, 3+0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           228,4+0,776,418,416,368,4+0,
                                                                                                                                                                                                                                                                                                                                         IMET/2HKM, IH)/, INSTAL/2HVA, 2HFB, 2HKB, IHC/
ISTAB/2HST, 2HAB, 2H H, 2HT;/, ISIGHA/2HSI, 2HGN, 2HA;/
                                                                                                                                                                                                                                                                                                                      ICUD/2HCR, 2HOS, 2HS , 2HUI, 2HND, 2H 6, 2HIH, 2H (, 2HH)/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          778,516,518,418,4+0,778,568,568,408,4+0,368,416,458,268,4+0,778,108,108,778,4+0,
                                                                                                                                                                                                                                                                                                        2H 4, 2H06, 2H 8, 2H08, 2H12, 2H66, 2H16, 2H66/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                768, 18, 18, 768, 4+0, 748, 28, 18, 28, 748, 3+0,
                                                                                              300.,338.,340.,370.,380.,410.,420.,450.,460.,490./
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   0,418,776,418,4+0,428,416,766,408,4+0,
                                                                                                                                                                                 2H46,2H45,2H50/
XAX/460.0,100.0,100.0/, YAX/90.0,90.0,410.0/
YCD/90.,90.,410./
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DATA IALTCH/368,418,418,368,4+0,0,218,778,18,4+0
                                                                                                                                                                                                                                                                                                                                                                                                   NAFIL/2HFI, 2HLE, 2H U, 2HSE, 2HD I/
 DATA ISURTI/2HBU, 2HRF, 2HAC, 2HE , 2H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DATA IALTC1/0,128,128,128,4+0/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      READ THE COMMON DISK FILE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           368,418,418,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IAL.TCL/0, 125,6+0/
                                                                                                                                                                                                                                                                                                                                                                                  1F0UR/2H40, 2H00/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IALTF/0, 18,6+0/
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                                                                                                                                       190.07
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CALL SUBROUTINE CLEAR TO CLEAR SCREEN IF RUMIING ON THE PLASMASCOPE
                                                                                                                                                                                                                                                                                                                                                                                               C. . . IF CRT VERSION IN AND FORM DRAUING NOT DESIRED, DELETE FORM DRAUING
          CALL SUBROUTINE VERSH TO DETERNINE IF RUNNING ON PLASHASIOPE
                                                                                                                                                         LOAD THE ALTERNATE CHARACTER SET INTO THE PLASAMASCOPE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DRAW THE SURFACE PRESSURE, DEHSITY, AND, 1F REQUIRED. STABILIZATION HEIGHT AND SIGMA LABELS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALL CHAR(20.0,475.0,0,ISURLI,60,2,1)
IF(LVRPL9)CALL CHAR(460.0,470.0,0,IEXP3,1,2,1)
IF(LVRCRI)CALL CHAR(316.0,470.0,0,IEXP3,1,2,1)
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                                                                                                                                                                                                                                                                                                                    THIS SECTION DRAWS THE NET PLOT FORM
                                                                                                                                                                                                                                                                                                                                                                                                                           IF ( LVRCRT . AND. (MFORM.EG.0) ) GO TO
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CHAR( 20.0, 490.0, 0, 10ATL, 4, 2, 1)
                       (IVERSH-6) OR CRTCIVERSH-15
                                                                                                                                                                                                          CALL LALT( 14+, JALTCH(289), 6)
CALL LALT( 14+, JALTC)( ( ), ( )
CALL LALT( 14+, JALTSP, ( )
CALL LALT( 14+, JALTCL, ( )
                                                                                                                                                                                                LALTCHA, JALTCHCBI ), 26,
                                                                                                                                                                                  CALL LALTCING, IALTCH, 10)
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                                                                                                                                                                                                                                                                  CALL LALTCIN., JALTP, 15
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                                                                                                                               IFCLVRPLB) CALL CLEAR
                                                               LVRCRT - IVERSH , HE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL LINE(XL, YL, 2, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             XL(1) = 164.0
XL(2) = 192.0
CALL LIHE(XL,YL,2,0)
                                                                            LVRPLS - . NOT. LVRCRT
                                                   CALL VERSH(IVERSH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         XL(2) = 76.0
YL(1) = 473.0
YL(2) = 473.0
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YL(1) = 400.0
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C XAX AND YAX ARE SET IN A DATA STATEMENT--THE USE OF THE XSCALE
C REDUCES THE NET PLOT OH THE X AXIS.
C
                                                                                                                                                                  PRIM! SURFACE HEADER -- TOP LAYER HEADER -- BOT LAYER
                       CALL CHAR(374.0,475.0,0,1STAB,8,2,1)
CALL CHAR(466.0,475.0,0,1STL(4),1,2,1)
                                                                         CALL LINE(XL,YL,2,0)
CALL CHAR(374.0,490.0,0,181GNA,6,2,1)
XL(2) = 410.0
                                                                                                                                                                                                                               IF(ICALC .EQ. 1)1 = 32
Call Char(222.0,461.0,0,ISURTI,I,2,1)
                                                                                                                                                                                                                                                                                               CALL CHAR( 222. 8, 461. 8, 0, ISURT, 1, 2, 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                DRAW POTENTIAL TENPERATURE LABEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CALL CHAR(30.0,440.0,0,1PT,22,2,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         8 CALL CHAR(30.0,458.0,0,1DI,24,2,1)
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                                                                                                                                                                               HEADER (IF REGUIRED)
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                                                                                                                                                                                                                                                                                                                                                           CALL LINE(XL,YL,2,0)
XL(1) = 302.0
XL(2) = 374.0
CALL LINE(XL,YL,2,0)
                                                                                                                                        CALL LIMEC XL, YL, 2, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL LINE(XL, YL, 2, 03
CALL LINE(XL,YL,2,0)
IF(LVRPLS)GO TO 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DRAU X AND Y AXIS
                                                                                                                                                                                                       3 IFCLVRCRT >GO TO 4
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                                                                                                                                                                                                                                                                                                          XL(1) = 222.0
XL(2) = 278.0
YL(1) = 459.0
YL(2) = 459.0
                                                XL(1) = 374.0
XL(2) = 422.0
                                                                                                                YL(2) = 488.0
YL(2) = 468.0
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C XSCALE 18 USED HERE TO SHIFT THE WIND DIRECTION AXIS TO THE LEFT C 1F(I .EQ. 1)CALL CHAR(84.0,80.0,0,IMINUS,1,2,1) 10 CALL CHAR(COORD,80.0,0,IXHUM(1),2,2,1) DRAW WIND DIRECTION ANIS

.HE. 13)CM.L LINE(XL,YL,2,0)

XL(1) = XL(1) + XIM5/2.0 XL(2) = XL(2) + XIM5/2.0

CALL LINE(XL, YL, 2, 0)

XL(1) = TIC XL(2) = TIC

0315 9160 1169

0317

1=1,13 TIC + XINC

00 00 COORD 11(2)

11C =

C MINC 18 THE SPACE BETWEEN EACH TIC MARK

0304 0305 0306

9020 6960

- XAX(2))/12.0

CALL CHAR(100.0,70.0,0,1STL,24,2,1)

DRAW X AXIS LABELS

300.0 • XSCALE 0330

CALL LINECKL, YL, 2, 0) YL<1) = 60.0

C KSCALE IS USED TO SHIFT THE WIND DIRECTION AXIS LABLE TO THE LEFT XC = 310.0 = XSCALE CALL CHAR(XC,40.0,0,1UD,20,2,1)

7550

DRAW WIND DIRECTION AXIS LABEL

C DO 15 SCALES THE TIC MARKS TO CONFORM TO THE SCALED DOWN C WIND DIRECTION AXIS AND WIND DIRECTION AXIS LABLE.

DRAU TICK HARKS ON UIND DIRECTION AKIS

16 CALL LINECKUDOM), YL, 2, 0)

XUD(K) - XUD(K) + XSCALE

2

DRAW TICK MARKS ON Y AXIS

0352 0353 0354

XL(2) = 102.0  $0.86 \times (1).5$ 

4-71

0332 0333

0331

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THE FOLLOWING THREE SECTIONS OF CODE PRODUCE AN X AND Y AXIS ON THE RIGHT HAND SIDE OF THE PLOT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DRIN TICK MARKS ON THE RIGHT HAND X AXIS AND NUMBER THE AXIS
                                                                                                                         DO 30 1-1,0
COORD = COORD - 20.0
CALL CHARK30.0,COORD,0,IALTL(1),2,2,1)
CALL CHARK30.0,COORD-20.0,0,IMET,3,2,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       78 CALL CHARK COORD 80.0, 3, IDINCH), 4, 2, 1)
                                                                                                                                                                                                                                                                                          C DRAW TIC MARKS ON THE RIGHT HAND Y AXIS C
                                                       CALL CHAR(64.0,YL,0,IYHUN(H),4,2,1)
CALL LIHE(XL,YL,2,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL CHAR(300.0,76.0,0,1005,18,2,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL CHARCKL, YL, 0, 1FOUR, 4,2,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DRAW THE RIGHT HAND X AXIS LABLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             thurs FOR and DASS and E .....
                                                                                                                                                                                                                                                                               CALL LINE(XCD, YCD, 3, 0)
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                                                                                                                                                                                                                                                                                                                                                                                                            CALL LINE(XL, YL, 2, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COORD - COORD + 25.0
                                                                                        DRAW Y AXIS LABEL
50 20 3=1,11
135 = 715 + 32.0
                                                                                                                                                                                                                                            XCD(1) = 300.0
XCD(2) = 500.0
XCD(3) = 500.0
                                                                                                                                                                                                          C
C DRAU THE NEW AXES.
C
                                                                                                              C00RD = 360.0
                   Y(1) - TIC
Y(2) - TIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TIC = TIC + XL(1) = TIC 
XL(2) = TIC
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DETERMINE SOME X AND Y COORDINATES AND TOTAL HUMBER OF POINTS
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                                                                                                                                                                                                                                                                                                                                                                                                                                  CALL SUBROUTINE TO ROTATE WIND DIRECTION FOR PLOTTING
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Cail code
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IF(APTEMP(1) .GT. 30.0)PTX(1) = 460.0 + XSCALE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PTX(1) = (APTEMP(1) + FAKT) + 2+XINC + 100.0
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IF(TEMP(1) .GT, 50.0)DTX(1) = 460.0 + XSCALE
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                                                                                                                                                                                                                                                                           IF (CHOIN.Y.EQ.1). AND.LVRCRT) GO TO 110
CALL CHARC 404.0, 40.0, 0, NOFIL, 10,2,1)
                                                                                                                                                                                                                                                                                                                            CURVEY(1) - ALT(1) + 0.08 + 90.0
                                                                                                                                                                                                                                                                                                             IF(ALT(1) .GE. 4008,00GO TO 50
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XINC = (MAK(1) = MAK(2))/12.0
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URITE THE SURFACE PRESSURE, DENSITY, AND STABILIZATION HEIGHT
CALL CHAR(204.,490.,0,IALPHA,4,2,1)
CALL CHAR(246.0,490.6,0,ITIMEZ,1,2,1)
IFCLVRFLS)CALL CHAF(248.0,490.0,0,EAUHTD(4),2,2,1)
IFCLVRCRT)CALL CHAR(246.0,490.0,0,LAUHTD(4),2,2,1)
                                                                                                                                                                                                                                                                                         CALL CODE
WRITE (IALPHA,2002) SURDEN
JF(LVRPLS)CALL CHAR(380.0,475.0,0,JALPHA,6,2,1)
JF(LVRCRT)CALL CHAR(260.0,475.0,0,JALPHA,6,2,1)
                                                                                                                                                                                                                                                                  IFKLWRPL8)CALL CHARK 196.0,475.0,0, IALPHA,6,2,1)
IFKLWRCRT)CALL CHARK 133.0,475.0,0, IALPHA,6,2,1)
                                                                                    IF(IPLACE .E0. 0)GD TD 74
) = IPLACE - IPLACE/3
IF(IPLACE.E0.4) I = 2
CALL CHAR(300.0,490.0,0,INSTAL(1,1),4,2,1)
                                                             IF NECESSARY, URITE THE INSTALLATION
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                                                                                                                                                                                         CALL LINE(XL,YL,2,0)
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CALL CODE
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YL(2) = 486.0
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CALCULATE AND URITE OUT THE EFFECTIVE CLOUP HEIGHT, STRMT
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TO BE MOVED UP AND DOWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DRAW TICK MARKS AT THE VALID DATA POINTS ON THE Y AXIS
                                                                                                                                                                                        CAI.L CHAR(DTX(ILP)+4.0, COORD, 0, ICRVT(2), 2, 2, 1)
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                                                                                     CALL CHARCUSK(TLP), COORD, 0, ICRVT(1), 2, 2, 1)
                                                                                                                                                                                                                                                                                            CALL CHAR(PTX(ILP), COORD, 0, ICRVT(3), 2, 2, 1)
                                                                                                                                                                                                                                                                                                                                                                                                                                CALL DLINE(UDK(II), CURVEY(II), NUMP, 0,4,8)
CALL LINE(UDK(II), CURVEY(II), NUMP,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL DLINE(UDX(11), CURVEY(11), HUMP, 0,4,8)
                                                                                                                                                                                                                          DRAW THE POTENTIAL TEMPERATURE LINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL LINE( WX (11), CURVEY( 11), HUMP, 0)
                              CALL DLINE(USK, CURVEY, 1LP, 0,4,4)
                                                  CALL DLINE(USK, CURVEY, ILP, 0, 8, 4)
                                                                                                                                                                                                                                                       CALL DLINE(PIX, CURVEY, ILP, 0, 4,4)
COORD = CURVEY(ILP) + 3.0
                                                                                                                    DRAW THE DRY TEMPERATURE LINE
                                                                                                                                                                                                                                                                                                                             DRAW THE WIND DIRECTION LINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COORD = STRALT * 0.08 + 90.0 CALL CLOUD(250.0,COORD)
                                                                                                                                                       CALL LINE(DIX, CURVEY, ILP, 8)
DRAW THE WIND SPEED LINE
                                                                                                                                                                                                                                                                                                                                                                                                IFCAUDIRCID GE. 0.00G0 TO
                                                                   COURD - CURVEY( ILP ) + 3.0
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                                                                                                                                                                       COURD . CURVEY(1LP) - 5.0
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YL(2) = YL(1)
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#### ORIGINAL PAGE POOR QUALITY

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IF NOT RUMING OM THE PLASHASCOPE, DO NOT ASK LINKDCOFY GUESTION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -- THE Y VALUE IS DECREMENTED EVERY OTHER TIME THE LOOP IS EXECUTED
                                                                                                                                                                                                                                                                                                                                                                                        --HCEH AND KCEN ARE THE COORDINATES OF THE CENTER OF THE ELLIPSE
--AAK AND BAK ARE THE MAJOR AND MINOR AXES
                                                                                                                                                                                                                                                                IF(IV2 .EQ. 1)8TBHT = 0.5 + (ALT(LAYTOP) + STBALT - CLURAD)
                                                                                                                                                                                                                                                                                                                                                                                                                                          -- THE SIGN OF THE X VALUE IS CHANGED EVERY OTHER TINE THE LODP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF REQUESTED, URITE OUT THE BOTTOM OF THE SURFACE LAYER LINE AND ALLOW IT TO BE MOVED UP AND DOWN
                                                                                                                                      IF(IV2 .EQ. 1)81G20 = (ALT(LAYTOP) - STBALT + CLDRAD;/4.3

IF(SIG20 .GT. 0.0)GO TO 91

STBHT = 0.5 * ALT(LAYTOP)

SIG20 = 0.64 * STBHT/2.15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAX = (GAMMAX+STBALT+0.08)+0.8
Bax = (0.5 + (Gammax+stbalt - Stbalt + Alt(Laytop))+0.08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF(JDEC.EG.I) YPT = YPT - YINC
RAD = AAX + SQRT(1.0 - ((YPT-KCEN)++2)/(BAX++2))
XELL(K) = HCEN + SIGN + RAD
YELL(K) = YPT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL MOVEMCLAYBOT, ILP,1,160T,414.0,BSHRK,5)
Botlay - altclaybot)
                                                                                                                                                                                                                                                                                                                                                                  DRAU AN ELLIPSE FOR THE EFFECTIVE CLOUD HEIGHT
                                                                                           ALTCLAYTOP))IV2 = 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL CHARK 464.8, 40.0, 0, FILE, 6,2,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Ĵ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      KCEN - STBHT + 0.08 + 90.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF(JSW.EQ.2) 81GN = -SIGN
IF(JSW.EQ.2) JSW = JSW - 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CALL LINE( XELL, YELL, 100,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IFCICALC . HE. 13GO TO 100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SPECIFY THE DATA FILE USED.
                                                                                                                                                                                                                                                              91 IF(IV2 .EQ. 1)8TBHT = 0.3
92 UKITE (6,666) 8TBHT
666 FORMAT( "SIBHT =",E14.6)
                                                                                           .ee.
                                             CLEFRAD = 2.15 + 81GX0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          160 IFKLVRCRTSGO TO 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YPT = KCEN + BAX - XPT = HCEN
                                                                                      IF CLDRAD+STBALT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               YINC - BAX/25.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YELL(1) = YPT
XELL(1) = HCEH
                  - STBALT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CALHT - BOTLAY
                                                                                                                   91620 - SIGKO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DO 99 K-2,100
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1 + MSC = MSC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               HCEN = 400.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  JDEC = -JPEC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SICH - 1.0
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CALL CLEAR AND N3RAF TO CLEAR PLASMASCOPE AND TERMINATE Graphic McDe CALL CHARC(168.0,16.0,0,1HARD(10),8,0,0)
CALL CHARC(732.0,16.0,0,1HARD(14),6,0,0)
CALL IN(1,JTYPE,0.0,0,0,0,0,0,0,0,0,31,0,31,1X,1Y)
IF(IX .GT. 15)GO TO 110
CALL RUDIS(NAME,1)
CALL HGRAF
CALL REC(9,RMETQ)
CALL RUDIS(NAME,0) WRITE OUT THE CONMON DISK FILE CALL CLEAR IF(LVRPLS) CALL CLEAR CALL HGRAF TERMINATE RNTP8 \*\*\* 810P END END 110 CALL RUDISCHANE, 1) ၁ ၁ ၁ 0659 0661 0663 0663 0664 0666 0668 0672 0673 0673 0673 0673 0673

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CONMON STBALT, STBHT, STBAZD, STBRMG, STBTIM, CLDRAD, RISTIM(30), BOTLAY, TOPLAY, CALMT, LAYTOP, LAYBOT, REFLEC, 1PTZ \*REEDS, CABB1 .815 COMMON SICKO, SICK, SICZO, SICAP, KDIST, YDIST, EKPZ, SUSICZ, SICY, SICAL, (AA, VPAR(7)), (BB, VPAR(B)), (CC, VPAR(B)), (HEATH, VPAR(12)), (HEATH, VPAR(12)), (HEATH, VPAR(12)), (PGG, VPAR(14)), (PGG2, VPAR(15)), ( COMMON ALT(30), IDIR(30), SPEED(34), TEMP(30), PRESS(30), PTEMP(30), COMMON YPOS, YES, ISNSFO, IVHICL, IRUN, ICASC, IPLACE, ITINEZ, IGOTMP, NUMRUN, LU, NUM, MONLY, MFORM, LUPNA, ITDU, IPL1, IPL3, IPL3 EQUIVALENCE (GC1, VPAR(1)), (GC2, VPAR(2)), (GC3, VPAR(3)), AND URITES COMMON AREAS TO DISC (BTI, VPAR(4)), (GT2, VPAR(5)), (GT3, VFAR(6)), COMMON PI, FIOVR2, FI43, TUOPI, SOR2PI, DEGRAD, RADDEG, IV2 COMMON LTIME, LTIM, LDAY, LMONTH(2), LYEAR, LAUNTD(18) LOGICAL LTIME COMMON CONMAX, COINCER, DOSMAX, BOSFK, RHGSMC, RHGSMD EQUIVALENCE STATEMENT FOR YENICLE PARAMETERS CONCENTRATION AND DOSAGE VALUES AND RANGES VARIGUS REED PROGRAMS CLOUD STABILIZATION AND LAYER PARAMETERS KRITPT T=66603 18 CH CR60663 USING 66052 BLKS R=6060 CONMON ISTIME, ISDAY, ISNOM 2), ISYEAR COMMON ITIME, IDAY, INGNTH(2), IYEAR Cldlng, Avspd, Avdir, Sigaz INTEGER UNCBC1447, (IGUI-COST) .FTH4%,L SUBROUTINE RUGIS(HAME,JJ), DIFFUSION COEFFICIENTS TO BE UTILIZED BY THE SUBROUTINE READS CONHON VPAR< 18), SIGHCL SURDEN, FILE(3) VEHICLE PARAMETERS OFTION PARAMETERS CALCULATION TIME HATH PARCHETERS SOUNDING TIME COMMON AREAS LAUNCH 718E INTEGER FILE HET DATA INTEGER YES THIS ? ?  $\hat{\mathcal{C}}$ ? ? ? ? ? ?  $\hat{\hat{}}$ ပ ن ں Ç 6100 0029 0030 0033 6643 91.00 0049 6653 0054 0025 0026 0035 9600 6038 0039 0042 1.100 043 004F 0025 9500 0613 9100 2100 8109 0027 6031 0032 0040 0620 0051 0052 0.657 00500 0000 9000 0100 6613 0020 0022 0023 0624 0028 **0034** 6037 0000 2000 0000 0609 0012 100 0021 100 4-78

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COMMON ALICAD), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30),
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                                                                                                                   CB.) *** IF THE BCRATCH DATA FILE (1.e. -REED2) ISH'T THEPE, CREATE IT CB.) *** B E W A R E II BE SURE FILE IS PURGED BEFORE STARTING RUN II CALL OPEHKO "B. IERP, MAHE, 0)

IF ( IERR,LT. 0) AND. (IERR.ME.-6) WRITE(6,778) ISRR

778 FORMAT(" *** ATTEMPT TO GFEW, IERR "",14)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMMON YPOS, YES, 1916/FO, IVHICL, IRUN, ICALF, IPLACE, ITINEZ, IGOTMP, MUMRUN, LU, NUM, MOMLY, MFORM, LUPRNT, ITOU, IPLI, IPL2, IPL3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                THIS SUBROUTINE MOVES THE TOP AND BOTTOM SURFACE LAYER LINES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   UP AND DOWN ON THE NETEROLOGICAL PROFILE PLOTS, AS SPECIFIED
                                          CB.J *** ISIZE(1) * 0 BLOCKS EXPECTED TO GE URITTEP READ DURING RUII
CB.J *** ISIZE(2) * 0 UORDS IN THE COMMON BLOCK TO BE TRANSFERRED
                                                                                                                                                                                                                                                                                                                                                                                                                                    SUBROUTINE MOVEM JND, MAX JND, MINJND, LAB, XLABEL, XLINE, MLINE),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMON PI,PIOVK2,P143,TUOPI,SOR2PI,DEGRAD,RADDEG,IV2
                                                                                                                                                                                                                                                                                                                                     IF(JJ.EQ.1)CALL WRITF(OUCB, IERR, OBUF, ISIZE(2))
IF(JJ.EQ.0)CALL READF(OUCB, IERR, OBUF, ISIZE(2))
                                                                                                                                                                                                                                       CALL CREATCOCCB, IERR, HAME, ISIZE, 3.0.0, 144)
IF(IERR, LE.0) WRITE(6, 799) IERR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CONNON ISTINE, ISDAY, ISNEW 23, ISYER?
                                                                                                                                                                                                                                                                                    FORMATC" *** CREATE/OPEN, IERR=",14)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONNON ITINE, IDAY, INONTH(2), IYEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                          *CAB, 81 0813
                                                                                                                                                                                                                                                                                                                          *** READ OR URITE, AS PER ORDER
DIMENSION HAME(3) , 1SIZE(2)
EQUIVALENCE (OBUP(1), PI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMMON VPAR(18), SIGHEL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VEHICLE PARAMETERS
                                                                                                                                                                                                                                                                                                                                                                                      CALL CLOSE(ODCB, 1ERR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OPTION PARAMETERS
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                                                                                             DATA 1512E/30,557/
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#### UHIGINAL PAGE OF POOR QUALITY

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CLOUD STABILIZATION AND LAYER PÜRÄHETERS
COMMON STBALT, STBHT, STBARG, STBTIM, CLDRAD, RISTIM(30), BOTLAY,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          INTEGER QUESCI3, AMS1, AMS2(2), AMS3(4), BLAHKS(26)
DIMENSION LABCI), KLIMECI), YLIMEC2), JNDALIC3), JNDVARC3,4)
EQUIVALENCE CJNDVR1, JNDVARC1,1)), CJNDVR2, JNDVARC1,2)),
CJNDVR3, JNDVARC1,3)), CJNDVR4, JNDVARC1,4))
DATA QUES/ZNIAC,2H ,2H ,2H ,2H ,2HF ,2HSU,2HRF,2NIAC,2HE ,2HLA,
                                                                                                                                              COMMON SIGKO, SIGK, SIGZO, SIGAP, XDIST, YDIST, EXPZ, SOSIGZ, SIGY, SIGAL,
                                                                                                                                                                                                                                                                                                                                                                                                                                       FORMAT(2K," UP/DOUN/CONT. SECTION ****IANS= ",A2," IX,IY=",213)
                                                                                                                                                                                                                                                                                                                               (HEATH, VPAR(10)), (HEATH, VPAR(11)), (HEATA, VPAR(12)),
                                                                                                                                                                                                                                                                                                                                                                (PAL203, VPAR(16)), (PHO, VPAR(17)), (GANMAX, VPAR(18))
                                                                                                                                                                                                                                                                                                                                                 (PHCL, VPAR(13)), (PCD, VPAR(14)), (PCD2, VPAR(15)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ANSI/ZHUP/, ANSZ/ZHDO, ZHUN/, ANSZ/ZHCO, ZHNT, ZHIN, ZHUE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IF FIRST PASS, URITE QUESTION. . OTHERWISE SKIP TO AHSWER
                                                                                                                                                                                                                                                                        EQUIVALENCE (QC1, VPAR(1)), (QC2, VPAR(2)), (QC3, VPAR(3)), (Q11, VPAR(4)), (Q12, VPAR(5)), (Q13, VPAR(6)),
                                                                                                                                                                                                                                                                                                            (44, VPAR(7)), (88, VPAR(8)), (CC, VPAR(9)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CC+++ATTEMPT TO PREVENT GVERURITING ON CRT VERSION...JSH
CONMON LTIME, LTIM, LDAY, LMONTH(2), LYEAR, LAUNTD(10)
                                                                                                                                                                                                                   COMMON CONMAK, CONCPK, DOSMAK, DOSPK, RNGSHC, RNGSHD
                                                                                                                                                                                                                                                      EQUIVALENCE STATENENT FOR VEHICLE PARAMETERS
                                                                                                                                                                                                      CONCENTRATION AND DOSAGE VALUES AND RANGES
                                                                                          TOPLAY, CALHT, LAYTOP, LAYBUT, REFLEC, 1PTZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               INITIALIZE NEW ALTITUDE LEVEL INDEX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      YLINE(1) = ALT(JHD) + 0.08 + 90.0
YLINE(2) = YLINE(1)
                                                                                                                                                               CLDLNG, AYSPD, AYPIR, SIGAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    START LOOP TO FIND DESIRED LEVEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CALL LINECKLINECUD, YLINE, 2, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IFCHEUJHD .EQ. JHD SGO TO 11
                                                                                                                        DIFFUSION COEFFICIENTS
                   LOGICAL LTIME, LVERSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       2HYE, 2HR:/
                                                                                                                                                                                                                                                                                                                                                                                                                                                          FORMAT (F6.1)
FORMAT (* "13".0")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DATA BLANKS/26+2H
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LVERSH = 1 .EQ. 7
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QUES(4) = LAB(2)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL VERSH(I)
                                                                                                                                                                                                                                                                                                                                                                                                                         FORMAT(A2)
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IF NOT CONTINUE, MOVE THE LINE--BUT DO HOT LABLE IT OR FILL IN THE TABLE
                                                                                                                                                                                                                                                                       IF( (IAMS.NE.2HDD) , AND. (IAMS.NE.2HCO) ) GO TO 13
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IF CONTINUE, LABLE THE LINE AND FILL IN THE TABLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL CHARKKLABEL, YLABEL, 0, JHDVAR(1,1),6,2,1)
YLABEL = YLABEL - 10.0
IFCHEWJHD .EQ. JHD)GO TO 1:
50 24 I=1,NLINE
                                                                                                                                                                                                                                                                                                                                                                                                                    CALL IHK1,3,0.8,0.0,0,0,0,0,31,0,31,1X,1Y)
Continue
                                                                                                                                               THIS IS THE UP/DOWN/CONTINUE DECISION AREA
            CHARC(0.0,Y,-1, QUES, 26,3,0)
CHARC(29.0,1.0,-1, AHS1,2,0,0)
                                                         , 1, 0, -1, HH32, 4, 0, 0)
                                                                                       CALL, CHARCK 43, 8, 1, 8, -1, ANS3, 8, 3, 8)
CALL, CHARCK 43, 8, Y, -1, ANS3, 8, 3, 8)
,-1,GUES,26,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 URITE (JHDALT,2000) ALT<br/>CALL CHAR(460.0,Y,0,JHDALT,6,2,1)
                                         CALL CHARC(29.0,Y,-1,AHS1,2,0,0)
                                                                                                                                                                            IF PLASMASCOPE, GO TO TOUCH INPUT
IF<LVERSH) GO TO 12
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CALL CHAR(460.0, Y, 0, LAB, 4,2,1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       URITE (JNDVR3, 2000) SPEED(JHD)
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                                                                                                                                                                                                                                                                                                                              IF  IANS.NE.2HD0 > G0 T0
                                                                                                                                                                                                                                                                                                  THIS IS CONTINUE OR DOWN
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IF(IX, LE. 20)GO TO 25
                                                                        CHARC(36.0
                                                                                                                                                                                                                                                       READCLU, 91 ) I ANS
                                                         CALL CHARCK 36.0
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 CALL CHARC(0.0
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THIS BUBROUTINE COMPUTES THE WIND DIRECTION LABELS
                                                           CALL CHARKKLABEL, YLABEL, 0, JHDVARK1, 15, 6, 1, 15
YLABEL = YLABEL - 10, 0
CALL CHARK 0.0, 1, 0, -1, BLAHKS, 51, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IFCUE(I) .LT. 0.03Mb(I) = WP(I) + 360.0
CONTINUE
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CALL CHAR( 460.0, Y, 0, JHDALT, 6, 1, 1)
                                                                                                                                                                                                                                                                                                                                GIMENSION UD(1), ENDPT(4), NUMUP(4)
                                                                                                                                                                                                                                                                                                                                          EQUIVALENCE (J.LEAST)
DATA ENDPT/0.0,90.0,180.0,270.0/
DO 2 I=1,4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IF(C2 .LT, 0.0)C2 = C2 + 360.0
IF(ABS(CI-C2) .LE, 180.0)G0 T0.6
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DO 12 1=2,4
IFCHUMUPCI) .GE. LEAST)GO TO 12
                      СЫLL СИАК(460.0,Y,0,LAB,4,1,1)
YLABEL = 450.0
DO 26 I=1,4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IF(CI .LT. 0.0)CI = CI + 360.0
                                                                                                              IFCIX GE. 173GD TO 28
HEWJHD - MINOCJND + 1,MAKJND?
                                                                                                                                                              HEUJHD - MAXOC JHD - 1, MINJND)
                                                                                                                                                                                                                SUBROUTINE WINDS(UD, NUD, 18C)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DO 17 I=1, HUD
UD(1) = UD(1) - ENPFT(1SC)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      HUMUP(3) = NUMUP(3) +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C2 = UD2 - ENDPT(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          CI = UDI - ENDPT(J)
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50 22 1=2,Hub
ub1 = ub2
ub2 = ub(1)
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ND2 = UE(1)

D0 8 1=2,140

ND1 = UD2

ND2 = UE(1)

D0 6 J=1,4
                                                                                                                                      JHD = HEUJND
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GO TO 1
            Y = Y + 10.0
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CLOUD STABILIZATION AND LAYER PARAMETERS COMMON STBALT, STBMT, STBMZD, STBTH, CLDRAD, RISTIM(30), BOTLAY, TGFLAY, CALNT, LAYTOP, LAYBOT, REFLEC, 1P12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMON SIGKS, SIGZO, SIGAP, XPIST, YDIST, EXPZ, SOSIGZ, SIGY, SIGAL,
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CPHCL, VRARC 1333, CPC 0, VRARC 1433, CHERT VRARC 1533.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMON ALT(30), IDIR(30), SPEED(30), TENP(30), PRESS(30), PTENP(30),
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                                                                                                                                                                                                                                                                                                                                                                                                          COMMON YPOS, VES, 1940FO, 1VHICL, IRUN, ICALC, IPLACE, 1TINEZ, IGOTHP, NUMFUN, LU, NUM, MONLY, MFORM, LUFRNT, 1TDU, IPL1, IPL2, IPL3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EQUIVALENCE (GCI, VPAR(1)), (GC2, VPAR(2)), (AC3, VPAR(3)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               < 071, VPAR< 4 >>, CQT2, VPAR(5 >>, CQT3, VFAR(6 >>),
                                                                                                                                                                                                                                                                                                   COMMON PI, PIOVR2, P143, TUOPI, SAR2PI, DECRAD, RADDEG, IV2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (44, VPAR(7)), (88, VPAR(8)), ((C, VPAR(9)),
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Logical Ltime
                                                                                                                                          DRAWS A CIRCULAR CLOUD FOR THE HET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONCENTRATION AND DOSAGE VALUES AND RANGES COMMON COMMON, CONCPK, DOSHAX, DOSPK, RIGSHC, RIGSHD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EQUIVALENCE STATENENT FOR VEHICLE PARAMETERS
                                                                                                                                                        PROFILE, AT A SPECIFIED X AND Y POSITION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CONHON ISTIME, ISDAY, ISNOM 2), ISYEAR
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                                                                    SUBROUTINE CLOUD(XP, YP)
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RADIUS = GAMMAX + STBALT + 0.08

DO 7 I=1,61

X(1) = (RADIUS + COS(0.01745329252 + FLOAT(6 + 1))) + .8 + XP

7 Y(1) = RADIUS + S1HY 0.01745329252 + FLOAT(6 + 1)) + YP

CALL LINE(X,Y,61,0)

RADIUS = 5.0

X(1) = XP + RADIUS

X(2) = XP

X(3) = XP

X(4) = YP

Y(5) = YP + RADIUS

Y(4) = YP

Y(5) = YP

Y(4) = YP

Y(5) = YP

Y(5) = YP

Y(5) = YP

Y(5) = YP

Y(6) = YP

Y(7) = YP

Y(7) = YP
           C THE MULTIPLICATIVE CONSTANT .8 WAS INTRODUCED TO DRAW A CIRCULAR
C CLOUD WITH XSCALE IN USE.
                                                                                                                                                                                                                 CALL LIME(X,Y,S,0)
x(2) = XP - RADIUS
Y(2) = YP
CALL LIME(X,Y,2,0)
X(3) = XP
Y(3) = YP + RADIUS
CALL LIME(X(3),Y(3),2,0)
RETURN
END
DIMENSION X(61), Y(61)
                                                                                                                                                                                                          Y(5)
                                                                                 ~
0389
0381
0381
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0386
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0388
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FTH4%,L Program RCOMS(3),REEDS COMC. & BOSAGE PROG...UPDATED 12 22 79, CBJ COMMON STBALT, STBHT, STBAZD, STBRNG, STBTIM, CLDRAD, RISTIM(30), BOTLAY TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, 1PTZ COMMON BIGKO, SIGK, SIGZO, SIGAP, KDIST, YDIST, EKPZ, SGSIGZ, SIGY, SIGAL, CLDLMG, AVSPD, AVDIR, SIGAZ CHERTH, VPGRC18)), CFG1H, VPGP-11-1-, CHEGTA, VPGPC12-); COMMICH ALICAD), 1018(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30), CPAL203, VPARC1600, CPHO, VFAPC1, 000, CARBIAS, VFAFC1800 COMMON YPOS, YES, 19NOFO, IVNICL, IRUN, ICALC, IPLACE, ITIMEZ, IGOTMP, NUMRUN, LU, NUM, MONLY, MFORM, LUPRNT, ITDU, IPL1, IPL2, IPL3 EQUIVALENCE (QC1, VPARC1), (QC2, VPARC2), (AC3, VPAPC3)), (QT1, VPARC4), (QT2, VPARC5)), (QT3, VPARC5)), COMMON PI, PIOVR2, PI43, THOPI, SARZPI, DEGRAD, RADDEG, 1V2 (AA, VPHC(7)), 198, VPAR(8)), ((C, YPHP(9)), A PROGRAM OF CONNON LTINE, LTIN, LDAY, LNONTH(2), LYEAR, LAUNTO(10) CONNON COMMAK, CONCPK, DOSHAK, DOSPK, PHGSHC, RHGSMD EQUIVALENCE STATEMENT FOR VEHICLE PARAMETEPS CONCENTRATION AND DOSAGE VALUES AND RANGES CLOUD STABILIZATION AND LAYER PARAMETERS 4RCOHS T=40003 IS GH CR66663 USING 00673 BLKS R=0066 CONCENTRATION AND DOSAGE PROGRAM CONNON ISTINE, ISDAY, ISHON(2), ISYEAR COMMON ITIME, IDAY, INDNING2), IYEAR REEDS SERIES OF PROGRAMS DIFFUSION COEFFICIENTS CONMON VPAR(18), SIGHCL SURDEN, FILE(3) VEHICLE PARAMETERS LOGICAL LTIME, LVERSH OPTION PARAMETERS CALCULATION TIME HATH PARAMETERS SOUNDING TIME COMMON AREAS LAUNCH TINE INTEGER FILE INTEGER YES HET DATA ? ? ? ? ? ? ? ?? ? ?  $\hat{\mathcal{L}}$  $\hat{\hat{}}$ 629 9800 1028 0015 922 1000 038 620 6949 9659 6100 0023 9 3 3 5 9652 0053 6055 0037 1960 7000 6665 3000 6007 6000 6909 100 0012 2190 0016 7100 0018 6920 6021 0622 956 1696 1691 0034 9200 0.003 9 - 0 - 0 7 00 0024 4-85 ٤ (

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FIND OUT IF THIS IS THE CRT OR PLASHASCOPE VERSION OF REEDZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CALL GRAF TO INITIALIZE SCOPE CAPPROPRIATE ONLY WHEN USING
                                                                             *ODISTANCE*4X*CONCENTRATION*5X*DDSAGE*6X
*TIME AFTER LAUNCH(SEC)*,11X,*POSITION FROM PAD*,
* (METER9)*8X*(PFM)*8X*(PFH SEC)*8X*START*3X*FINISH*,
                                                                                                                                                                                                                                                                                                                                                                                204 FORMAT (//"0****CONCENTRATIONS AND BOSAGES WITH 10 BEGREE"
                                                                                                                                                                                                                                                                                                                                                                                                                                                              6X"MATERIAL"5X"CONCENTRATION(PPM)"11X"EOSAGE(PPM)")
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DINENSION FACT(3), CHIPPL(3), DAINPL(3), HATS(3,5), HANE(3), NAMEF(3), ILINE(32), IDATAF(10), IERS(32), XD1STV(81), GOSV(81), CONCV(61)
                                                                                                                                                          201 FORMAT (1XS -1,8XF7.3,8XF7.1,3XF5.1,3XF5.1,16K,2F8.1)
202 FORMAT (//*0****FOINT OF MAXIMUM CONCENTRATION****/
6X*RANGE FROM PADKM): "F8.1/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            *F8.3)
                                                            200 FORMAT ("1"12X"CLOUD CONCENTRATIONS AND DOSAGES"/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DATA STATEMENTS
DATA HAME, 2HCO, 2HNS/, NAMEF/2H?R, 2HCO, 2HNS/
DATA IERS/32*2H /
                                                                                                                                                                                                                                                              6X"MAXIMUM CONCENTRATION(PPM): "F6.3)
                                                                                                                                                                                                                                                                               203 FORMAT (//"D****POINT OF MAXINUM GOSAGE***"/ 6X"RANGE FROM FAD(M): "FB.1/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      206 FORMAT (415,12)
C 207 FORMAT (7X3A2,6XFB.3" +/- "FB.3,4XFB.3" +/-
207 FORMAT (7X3A2,6XE8.3" +/- "FB.3,4XFB.3" +/-
                                                                                                                                                                                                                                                                                                                                                                 6X"HAXINUM GOSAGE (PPM SEC): "F6.3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DATA FACT/0.0, -0.174533, 0.174533/

DATA MATS/2H ,2HHC,2HL ,2H ,2H C,2HG ,

2H ,2HCO,2H2 ,2H A,2HL2,2HO3,

2H ,2H N,2H0 /
                                                                                                                                                                                                                       6X*DIRECTION(DEG): "F5.3/
                                                                                                                                                                                                                                                                                                                     6X"DIRECTION(DEG): "F5.17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE AND DIMENSION STATEMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                               6X"AZIMUTHKOEG): "F5.17
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                                                                                                                                                                                                                                          6X"HEIGHT(N): "FG.17
                                                                                                                                                                                                                                                                                                                                             6X"HEIGHT(N): "F6.17
                                                                                                                                                                                                                                                                                                                                                                                                         "UNCERTAINTIES+++,">
 OUTPUT FORMAT STATEMENTS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CALL VERSH(1)
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#### ORIGINAL PAGE POOR QUALITY

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DO LOOP FOR CONCENTRATION AND DUSAGE CALCULATIONS

0120

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GET PAD-RELATIVE RAIGE AIID AZINUTH TG APPROPRIATE CENTERLINE POSITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DOSPK * SIGHCL * EXPZ/(TWOPI * SIGY * AVSPD * SORT(0.5 * SOSIGZ))
                                                                                                                                                                                                                                                                                           (2.0 * CLDRND - ALTCLASTOP) + STBALT3/3.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              THE URITE STATEMENTS BELOW NAVE BEEN ADDED AS TENFORARY AIDS IN VALIDATING CALCULATIONS FOR DOSAGE AND CONCENTRATION.
                                                                                                                                                                                                                                                                     IF(IV2 .EQ. I)ACTVOL - PI . (ALT(LAYTOP) . CLDEAD - STBALT)**2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SET OFF-CENTERLINE DISTANCE TO • FOR CENTERLINE CALCULATION
                                                                                                                                                                                                                                                                                                                                             PREPARE CONSTANTS FOR RELATIVE PAD/CENTERLINE CALCULATIONS
STBAZR = DEGRAD + STBAZD
COSSTB = COS(PI - STBAZR)
                                                                                                                                                                                                                                           ACTVOL - P143 • CLDRAD • CLDRAD • CLDRAD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DOSYCHUMY) = DOSPK
CONCPK = DOSPK * AV3PD/CSAR2PI * SIGX)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SITANG - SORT(XREL*XREL + YREL*YREL)
                                             - RANGE FROM STABILIZATION
                                                                                                                    - MAXIMUM CONCENTRATION
                                                                                                                                                                                                                                                                                                             SIGHCL - SIGHCL + ACTVOL/10TVOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        * RADDEG * (PI - DIRPCL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF(DOSPK .LE. BOSHAXXGO TO 55
PAGSNO = XDIST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    XREL = XSTAB + XD13T+C0SAV
                                                                               DOSHAX - HAXIMIN DOSAGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YEEL - YSTAB + XDISTASINAY
                                                                                                  - CONCENTRATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        - ATANZ YREL, XREL)
                                                                                                                                                                                                                                                                                                                                                                                                   SINSTB . SINCPI - STBAZK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL DFEXP(LAYTOP, 1888.8)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COSAV = COS(PI - AVDIRR)
SIMAV = SIM(PI - AVDIRR)
                                                                                                                                                                                                                                                                                                                                                                                                                      XSTAB - STBRNG + COSSTB
                                                                                                                                                                                                                                                                                                                                                                                                                                      YSTAB - STBRNC + SINSTB
                                                                                                                                                                                                                                                                                                                                                                                                                                                       AVEIRE = DEGRAD + AVDIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       XDISTY(NUMV) = XDIST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONCVCHUNV - CONCPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DG 59 I=0,20000,250
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            URITE (LUPRHT, 200)
                                                                 - DOSOGE
                                                                                                                                                                                                                                                           TOTVOL . ACTVOL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DOSMAX * DUSPK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HUHY - HUHY +
                                                                                                                                                                                                                         FOSMAX - 0.0
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                                                                                                                  COHHOX
                                                                                                  CONCPK
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DOSPK
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IF REQUESTED, PLOT THE CENTERLINE FOSAGE AND CONCENTRATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                OTHERWISE, RESPOND WITH Y FOR YES, H FOR HO TO ANSWER QUESTIONS.
                                                                                                                                                                                                                                                                                                                                                                                           IF PLASMASCOFE VERSION, SKIP TO THE CALL TO "IN"
                                                                                                           ARVTIM = STBTIM + (XDIST - CLDLMG)/AVSFD
DEPTIM = STBTIM + (XDIST + CLDLMG)/AVSPD
WRITE (LUPAHT, 201) XDIST, CONCPK, DOSPK, ARVTIM, DEPTIM,
SITRHG, SITAZD
                                                                                                                                                                                                          IF THIS IS A PRODUCTION RUN, SKIP THE PLOTTING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF(IX .LE. 25)CALL CHAR(464., YPOS, 0, IERS,6,6,0)
IF(IX .GT. 25)CALL CHAR(304., YPGS, 0, IERS,6,0,0)
YPOS = YPOS - 32.
IF(IX .GT. 25)GO TO 61
EX = ALOGT(DOSHAK)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL 11K1, JTYPE, 0., 0., 0, 0, 0, 8, 31, 0,31, 1X, 1Y)
                                                                                 IFCANON(XBIST, 1000.0) . NE. 0.0)GO TO 59
                                                                                                                                                                                                                                                                                                                                      CALL CHAR(8., YPGS,0, ILINE,42,3,8)
CALL CHAR(384., YPOS,0, ILINE(25),8,3,0)
CALL CHAR(464., YPOS,0, ILINE(38),6,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALL CHAR(0., YPOS, 0, 1LINE, 64.0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF(EX .LT, 0.0)IEXFD = IEXPD - 1
IEVPD = - 'EXPP
IF(CONCPK LE. COMMAX)GO TO 58 RHGSHC = XDIST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  "YES" IS THE DEFAULT CASE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        THIS IS THE "HO" RESPONSE
                                                                                                                                                                                                                                                                                                          CALL DREAD(NAMEF, 2, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IF( IANS.NE.NO)GO TO 223
                                                                                                                                                                                                                                                                                                                        CALL LERSCYPOS, LVERSH)
                                                                                                                                                                                                                                    TECTRUM . EQ. 3 > GO TO
                                                                                                                                                                                                                                                                                                                                                                                                                     IFCLVERSN) GO TO 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        READCLU, 90) TANS
IFC TANS. EQ. 1HB >STOP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              in a filture in Coffbian
                          COMMAX = CONCPK
SGXMAX = SIGX
SGYMAX = SIGY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EXPD * EX
                                                                                                                                                                                                                                                                                VALUES
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IF THIS IS A PRODUCTION RUN, SKIP THE OFF CENTER CONCENTATION SECTION AND THE CALL OF PROGRAM RISOP -- IF NOT, DO OFF CENTER CONCENTRATIONS IF DESIRED
                                                                                CALCULATE AND URITE OUT THE POINT OF MAXIMUM CONCENTRATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OTHERNISE, RESPOND UITH Y FOR YES, H FOR NO TO AMEWER
                                                                                                                                                                                                                                                                 CALCULATE AND URITE OUT THE POTIIT OF HARITHM DOSAGE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IF PLASMASCOPE VERSION, SXIP TO THE CALL TO "IN"
                                 CALL CPLOT(XB15TY, DOSY, COMCV, NUMY, TEXPD, TEXPC)
CALL LABEL(TEXPD, TEXPC)
                                                                                                                                                                                                                             URITE (LUPRHT, 202) RNGPHC, DIRPHC, CALHT, CORNAR
                                                                                                                                                                                                                                                                                                                                                                                               URITE (LUPRHT, 203) RNGPHD, DIRPHD, CALHT, DOSHAX
                                                                                                                                                                                                                                                                                             XD19T = RHG3HD + COSAV + 9TBRHG + COSSTB
YD1ST = RHG3HD + 81HAV + 9TBRHG + 91HSTB
RHGPMD = 90RTCXD1ST + XD18T + YD1ST + YD1ST)
ARG1 = ATAM2CYD1ST, XD19T)
                                                                                                                                                              RUGPHC = SORTCXDIST + XDIST + YDIST + YDIST)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ARE OFF CENTER CONCENTRATIONS DESIRED?
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IF(EN .LT. 0.0)IEMPC = IEMPC = I
IEMPC = - IEMPC
                                                                                                                               XDIST = RNGSMC + COSAV + XSTAB
YDIST = RNGSMC + SIMAV + YSTAB
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                                                                                                                                                                              ARGI - ATMIZCYDIST, XDIST)
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CALL LERS(YPOS, LVERSH)
                                                                                                                                                                                                                                                                                                                                                              DIRPHO = PI - ARCI
DIRPHO = RADDEC + DIRPHO
                                                                                                                                                                                                 DIRPHC = PI = ARGI
DIRPHC = RADDEG * DIRPHC
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THE FOLLOWING CALCULATIONS AND READ AND WRITE SATEMENTS ARE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FORMAT(" DISTANCE AND CLIMUTH FOR XDIST", F6.1, "IS", 2F9.2)
FORMAT(IX," DISTANCE AND AZIMUTH FROM PAD IS: F10.3,3X, F10.3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CC+++THE WRITE STATENETS WITH FORMATS 351 AND 360 HAVE BEEN ADDED CC+++TO ADDRESS THE CURSOR FOR ANSWERING THE QUESTION FOR RANGE CC+++AND AZINUTH ON THE CRT ONLY...JSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          READCLU, #) XDIST
DPC=SGRTESTBRNG+*2 +XDIST+*2 - 2.*STBRNG+XDIST+COS(FI+STBAZR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           READ IN AND URITE OUT THE RANGE AND AZIMUTH FOR THE OFF CENTER CONCENTRATION CALCULP 'ON -- ENTERING A 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                B = PI - ABS(AVDIRR - STBAZR)
PPCAZ=RADDEG + ATAN(XDIST + BIN(B) + 2, + STBRNG)
                                                            IF(IX %E. ZS)CALL CHAR(464.,YPGS,0,IERS,6,0,0)
IF(IX .GT. 25)CALL CHAR(364.,YPGS,0,IERS,8,0,0)
YPOS = YPOS = 32.
                  CALL IN(1, JTYPE, 0., 0., 0, 0, 0, 0,31, 0,31, 1X, 1Y)
                                                                                                                                                                                                                                                                                             LOOP ON OFF CENTER CONCENTRATION REGUESTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FORHATCIX," ENTER A VALUE FOR XDIST? _*)
                                                                                                                                                      OFF CENTER CONCENTRATIONS ARE DESIRED
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TECYPOS I T 48.0 ANN.LYFPON) YPOS = 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /(STBRHG++2+DPC++2-XDIST++2))
                                                 CALL CHAR( 0., YPGS, 0, ILINE, 64, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                   CHAR . . . YPOS, 0, ILINE, 64, 0, 0)
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URITE(LU,712) DPC,DPCAZ
URITE (6,371) XDIST,DPF DPCAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IFCAVDIR .LE. STRAZD) FLIP = -1
                                                                                                                                                                                                                           CALL ORGINCINSET, IYSET, LVERSH)
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                                                                                                                                                                                                                                                                                                                                                                                                                                       IFC IRUH . NE. 1 ) GO TO 713
                                                                                                                                                                                                                                                                                                                                CALL DREAD(NAMEF, 5, ILINE)
CALL LERS(YPOS, LVERSN)
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                                                                                                                     IF( IX . GT. 25)C0 TO 81
                                                                                                                                                                                        WRITE (LUPRHT, 204)
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CALCULATE THE CONCENTRATIONS AND DOSAGES AT THIS POINT PLUS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HUNBER AT THE LOCATION WHERE THE OFF CENTER CONCENTRATION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ON THE PLOTTER, WRITE OUT AN ASTERISK AND THE ITERATION
                                                                                                                                                                                CELL INCO, JTYPE, 112., YPOS, 0, IDATAF, HIN, 0,31, 0,31, IX, IY)
                                                                                                                                                                                                                                                                                                                                                 INCO, JTYPE, 272., YPOS, 0, IDATAF, NIN, 0, 31, 0, 31, 1X, 1Y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           10 DEGREES UNCERTAINTIES ON EITHER SIDE
                                                                                                                                                                                                                                                                                                                                                                                                                             1FCYPOS .LT. 48.0>$POS = 458.0
1FCYPOS .LT. 48.0.AND.LVERSH>YPOS = 458.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              DETAP = PI - AVDIRR - ATANZ( "DEL, XDEL)
IFCLVERSH) YPOS = YPOS = 16.
IFCYPOS .LT. 48.0.AMD.LVERSH) YPOS
IFCLVERSH) CALL LERSCYPOS,LVERSH)
CALL CHARCO.0,YPOS,0,ILINE,54,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RDEL * SORT(XDEL+XDEL + YDEL+YDEL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WRITE (IPL3,206) 100,0,0,125,ITER
                                                                                                                                                                                                                                                                                                                                                                                                                                                               WRITE (LUPRHT, 205) BITRHG, SITAZD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IXPLOT = IXSET + 0.2631 + XSITEP
IYPLOT = IYSET + 0.3545 + YSITEP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              URITE (IPL3) -1,1,1XPL0T,1YPL0T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WATTE (IPL3) -1,1,1XPLOT, IYPLOT UALL SYNBL(100, IPL25, IH*, IPL3)
                                                                                                                                                                                                                               IFCSITRNG .LE. 0.00GO TU 78
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SITAZE>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               - SITAZR)
                                                                                                                WRITE(LU,351)JXAX, IPOS
FORMAT(" [4a"12"c"13"K[")
                                                                                                                                                                                                                                                                                                  FORMATO ELB"12"C"13"RE">
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CALCULATION IS DESIRED
                                                                                                                                                                                                                                                                                                                                                                                              IF (YPOS.LT.0.0)G0 T0 380 YPOS = YPOS - 16.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 - DEGRAD + SITAZD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SITRNG * COSSIT
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                                                                                                                                                                                                                READ ( 10ATAF, +) SITRHG
                                                                                                                                                                                                                                                                                                                                                                               READ ( IDATAF, +) SITAZD
                                                                                                                                                                                                                                                                                 URITECLU, 360 SUXAX, 1P0S
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YDEL - YSITEP - YSTAB
                                                                                                                                                                 CALL BLANK (IDATAF, 10)
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DELC = ABS(0,5 + (2,0 + CNNPL(1) - CNHPL(2) - CNHPL(3)))
DELD = ABS(0,5 + (2,0 + DNHPL(1) - DNHPL(2) - DNHPL(3)))
URITE (LUPRNT,207) < MATS(1,1),1=1,3), CNHPL(1), DELC, DNHPL(1), DELD
                                                                                                                                                                                     Y 19 PRINTED JUST TO PROVE THE CASE
URITE(6,997)BET, XCCSIT, YCCSIT, XDIST, YDIST=",5FB.f)
FORMAT(//" BET, XCCSIT, YCCSIT, XDIST, YDIST=",5FB.f)
FORMAT(//" BET, XCCSIT, YCCSIT, YDIST=",5FB.f)
CONC = DIST + BYSFD + SGRY + SGSIGZ))
                                                                                                                                                                                                                                                                                                                            WRITE(LUFRHT, 99) DAVDZR, AVDIRR, BETAF, ARG!, XDEL, YDEL, XDIST, YDIST, YDIST, YDIST, YDIST, YDIST, YSTAB

KSITEP, YSITEP, XSITEP, XSTAB, YSTAB

FORMAT(/5X2AVDIR", 4X"AVDIRR", 5X"BETAF", 6X"ARG!", 6X"XDEL",

6X"YDEL", 5X"XDZST", 5X"YDIST", 4X"XSITEF", 4X"YSITEF",
5X"XSTAB", 5X"YSTAB"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALCULATE AND URITE OUT THE CONCENTRATION AND DOSAGE FOR
                                                                                                                                                                         IS NOT DEFINED ... YCCSIT IS BEING SUR'D FOR Y
                                                         CALCULATE DISTANCE FROM CLOUD CENTER TO SITE OF HITEREST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 URITE (LUPRHT, 207) < MATS(1,2), 1=1,3), COHC, DLC, DOS, DLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    URITE (LUPRHT, 207) < MATS(I, 3), 1*1, 3), COHC, DLC, DOS, DLD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          URITE (LUPRHT, 207) (MATS(1,4), 1=1,3), CGHC, DLC, DÛS, DLD
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                                                                           RDEL . SINKARG!)
                                                                                          KCCSIT - RDEL * COSCARGIO
                                                                                                                               CALL DFEXP(LAYTOP, 1868.8)
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DLC = ARG1 + DELC
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                   ARGI = BETAF - FACT(1)
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DLD = ARG1 + PELD
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DLD = ARGI + DELD
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DINERWISE RESPOND WITH Y FOR YES AND 11 FOR 110 TO MISUER
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IF AN ISUPLETH PLOT IS DESIRED, CALL THE PROGRAM RISUP
REGUEST ANOTHER POINT FOR AN OFF CENTER CONCENTRATION
                                                                                                                                                                                                                         IF PLASKASCOPE VERSION, SKIP TO THE CALL TO "IN"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IF(IX .LE, 25)CALL CHAR(464, 7P09,0,1ER9,6,0,0)
IF(IX .GT, 25)CALL CHAR(304,,7P0S,0,1ERS,8,0,0)
P09 - 7P08 - 32.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL IH(1, JTYPE, 0., 0., 0, 0, 0, 31, 0, 31, IY)
                                                                   FINISHED WITH OFF CENTER CONCENTRATIONS
                                                                                                                                                                     CALL CHAR(8., YPOS, 0, ILINE, 62,3,0)
CALL CHAR(384., YPOS, 0, ILINE(55),8,3,0)
CALL CHAR(464., YPOS, 0, ILINE(30),6,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL CHAR( 0., YPOS, 0, ILINE, 64, 0, 0)
                                                                                                                     AN 1SOPLETH PLOT DESIRED?
                                                                                                                                                                                                                                                                                                                                                         "YES" IS THE DEFAULT CASE
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                                                                                                                                              CALL DREAD(HAMEF, 4, ILINE)
CALL LERS(YPOS, LVERSH)
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0539 C WRITE OUT THE CONMON DISK FILE
0540 C CALL RUDIS(NAME, 1)
0542 C KETURN TO THE MAIN FROGRAM REEDS
0544 C STOP
0545 C STOP
0546 C 60547 END

COMMON STBALT, STBAT, STBAZD, STBRIG, STBTIM, CLDRAD, RISTIM(30), BUTLAY. TOPLAY, CALMT, LAYTOP, LAYBOT, REFLEC, IPTZ DIFFUSION COEFFICIENTS COMMON 91GX0,SIGX,91GZ0,SIGAP,XDIST,YDIST,EXPZ,SQSIGZ,91GY,SIGAL C. BJORK CEBJY (HEATH, YPAR(10)), (HEATH, YPAR(11)), (HEATA, YPAR(12)), CONHON ALTC30), IDIRC30), SPEEDC30), TEMPC30), PRESSC30), PTEMP(30) (PHCL, VPARC13)), (PCO, VPARC14+) (PCO2, VPARC13)), (PAC203, VPARC16)), (PHO, VPARC17+) (CAC203, VPARC16)) COMMON YPOS, YES, 19NDFD, IVHICE, IRUN, ICALC, IPLACE, ITINEZ, IGOTNP, NUNRUN, LU, NUM, NONLY, NFORM, LUPRNT, ITDU, IPLI, IPL2, IPL3 EQUIVALENCE (GC1,VPAK(1))(GC2,VPAK(2))(GG3,VPAP(3))(C011,VPAK(4))(G12,VPAR(5))(G13,VPAF(6)) COMMON PI, PIOVR2, P143, TWOPI, SQR2PI, DEGRAD, RADDEG, 1V2 (AA, VPAR(7)), (BB, VPAR(8)), (CC, VPAR(9)), AND URITES COMMON APEAS TO CONNON LTINE, LTIN, LDAY, LNOHTH(2), LYEAR, LAUHTB(10) LOGICAL LTINE 7.9 CONCENTRATION AND DOSAGE VALUES AND RANGES COMMON COMMAX, CONCPY, EGSMAX, EGSPK, ENGSNC, RIGSND EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS 23 TO BE UTILIZED BY THE YARIOUS REED PRUCRAMS CLOUD STABILIZATION AND LAYER PARAMETERS 2 ... UPDATED CONNOH ISTINE, ISDAY, ISNOH(2), ISYEAR COMMON ITINE, IDAY, IMGNIH(2), IYEAR CLDLNG, AVSFD, AVDIR, SIGHZ NITEGER ODGR(144), (6)(F(552) SUBROUTINE RUDISCHAME, JAY THIS SUBROUTINE READS COMMON VPAR(18), SIGHCL VEHICLE PARAMETERS SURDEH, FILE(3) OPTION PARAMETERS CALCULATION TIME HATH PARAMETERS SOUNDING TIME CONNON AREAS LAUNCH TINE THTEGER FILE INTEGER YES HET DATA ? ? <u>``</u>  $\hat{\hat{}}$ ?  $\hat{\hat{}}$ ? Ŝ 0002 0015 9100 6100 0200 0 0 2 3 0024 6025 0026 0028 0029 0600 0033 0035 9638 6200 0040 8100 6100 6051 0056 5000 9000 2000 0014 9190 1200 0652 1000 2199 0022 0027 0032 0634 9640 7500 0053 0054 7000 8900 6090 0000 0013 7100 1100 0021 4-95

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RECORT 1-04663 IS 64 CR06603 USING 06692 BLKS

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CLOUD STABILIZATION AND LAYER PARAMETERS COMMON STBALT, STBHT, STBAZD, STBRNG, STBTIN, CLDRAD, RISTIN(30), BOTLAY, TOPLAY, CALNT, LAYTOP, LAYBOT, REFLEC, IPTZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMHON SIGXO, SIGX, SIGZO, SIGAP, XDIST, YDIST, EXPZ, SØSIGZ, SIGY, SIGML,
                                                                                                                                                                                                                    THIS SUBROUTINE PLOTS THE DOSAGE AND CONCENTRATION CENTERLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            COMMON ALT<30),1DIR<30),SPEED<30),TEMP<30),PRESS<30),PTEMP<30),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMMON YPOS, YES, 1946FD, IVHICL, IRUN, ICALC, IPLACE, ITIMEZ, IGOTMP, NUMRUN, LU, NUM, MONLY, MFORM, LUPRNI, ITDU, IPL1, IPL2, IPL3
            EQUIVALENCE (OBUF(1),F1)
CALL OPEH(ODCB, IERR, NAME, 0)
IF(IER LT. 0)CALL CREAT(ODCB, IERR, NAME, 14,3,0,0,144)
IF(JJ.EQ.1)CALL URITF(ODCB, IERR, OBUF, 557)
IF(JJ.EQ.0)CALL READF(ODCB, IERR, OBUF, 557)
                                                                                                                                                                                                                                                                                                                                                                                         COMMON PI, PIOVR2, P143, TWOPI, SQR2PI, DEGRAD, RADDEG, IV2
                                                                                                                                                  SUBROUTINE CPLOT(XDISTV, DOSV, CONCV, NUMY, IEXPD, IEXPC)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONCENTRATION AND DOSAGE VALUES AND RANGES COMMON CONMAX, CONCPK, DOSNAX, DOSPK, RNGSNC, RNGSND
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                                                                                                                                                                                                                                                                                                                                                                                                                                          COMMON VPAR(18), SIGHEL
                                                                                                 CALL CLOSE(ODCB, IERR)
                                                                                                                                                                                                                                                                                                                                                                                                                           VEHICLE PARANETERS
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DIMENSION NAME(3)
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OF The State CUALITY

(HEATH, VPAR(10)), (HEATM, VPAR(11)), (HEATA, VPAR(12)), (PHGL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VPAR(15)), (PAL 203, VFAK(16)), (PHO, VFAK(17)), (CAMMAX, VFAK(18)) (QT1,VPAR(4)),(QT2,VPAR(5)),(QT3,VPAR(6)), (AA, VPAR(7)), (BB, VPAR(6)), (CC, VPAR(9)), PLOT THE CONCENTRATION CENTERLINE CURVE DIMENSION XDISTV(1), DOSV(1), CONCV(1) |XPLOT = XD157461) + FXD18T + 775.0 |YPLOT = 605V(1) + F50S + 1640.6 URITE < IPL2) J, I, IXPLOT, IYPLOT = XDISTV(1) + FXDIST + 775.6 = CONCV(1) + FCONC + 1046.8 PLOT THE DOSAGE CENTERLINE CURVE FXD18T = 9295.0/30000.0 FD05 = 8231.0 + 10.0++(IEXPD - 1) FCONC = 8231.0 + 10.0++(IEXPC - 1) CALL SYMBL(100,100,25400B, 1PL2) WRITE (IPL2) J,1,1XPLOT, IYPLOT CALCULATE PLOTTING FACTORS SUBROUTINE LABEL( IEXPD, IEXPC) DIMENSION STATEBERT RETURN TO RCONC END OF CPLOT DO 16 1-1, NUMV DG 7 1=1, HUMV 1YPL07 1XFL07 RE TURN 9 ပ ပပပ 9121 9123 9124 9127 9127 9136 1156 9911 6129 9619 1133 134 0135 9619 **€£11** 0131 0132 1153 0154 53 1910 162 0163

EQUIVALENCE (QC1, VPAR(1)), (QC2, VPAR(2)), (QC3, VPAR(3)),

9119

4-97

THIS SUBROUTINE LABELS THE CONCENTRATION AND DOSAGE CENTERLINE

PLOTS

COMMON PI, PIOVRZ, PI43, TMPPI, SARAFI, DEGRAD, RADDEG, IVZ

HATH PARAMETERS

CONHON AREAS

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0173

1710

VEHICLE PARAMETERS

444

2210

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COMMON STBALT, STBALT, STBAZD, STBRNG, STBTIM, CLDKAD, RISTIM(30), BOTLAY, TOPLAY, CALMT, LAYTOF, LAYBOT, REFLEC, 1PTZ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (HEATN, VPAR(10)), (HEATM, VPAR(11)), (HEATA, VPAR(12)), (PHCL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VPAR(15)),
                                                                                                                                  COMMON ALTGO), IDIRGO), SPEEDGO), TEMPGO), PRESSGO), PTEMPGO), 918DFCO),
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                                               COMMON YFOS, YES, ISNOFO, IVHICL, IRUN, ICALC, IFLACE, ITINEZ, IGOTAF,
                                                               NUMBUM, LU, HUM, MONLY, MFORM, LUPRHT, ITOU, IPL1, IPL2, IPL3
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                                                                                                                                                                                                                                                                                                                      COMMON LTIME, LTIM, LDAY, LHOHTH(2), LYEAR, LAUNTD(10)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMMON CONMAK, CONCPK, DOSMAK, DOSPK, KNESMC, RHGSMD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CONCENTRATION AND DOSAGE VALUES AND RANGES
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FORMAT (415, 14, 1XA1, A2, 1X12, 1XA2, A1, 1X14)
FORMAT (415, 14" C"A2, 2X12, 1XA2, A1, 1X14)
                                                                                                                                                                                                                                                                   CONMON ISTIME, ISDAY, ISHOM 2), ISYEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ......
                                                                                                                                                                                                                     CONMON ITIME, IDAY, INGNTH(2), IYEAR
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URITE (1PL2,260) 0,150,-100,6,1
URITE (1PL2) -1,1,3700 8350
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COMMIN VPAR( 18), STONEL
                             OPTION PARAMETERS
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URITE (IPL2,204) 125,0.0,125,171ME,LAUNTD<4),1DAY,1MONTH,1YEAR
URITE (IPL2) -1,1,5725,8540
IF<LTIME>URITE(IPL2,205)205,0,0,205,LTIH,LAUNTD<3),LAUNTD<4),LDAY,
LMONTH,LYEAR
                                                                                                                                                                                                                                         WRITE (IPL2) 1,1,5525,9000
WRITE (IPL2) -1,1,6225,8950
WRITE (IPL2,203) 125,0,0,125,ISTIME,ITIMEZ,LAUHTO(4),ISDAY,ISHOH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CONNON YPOS, YES, ISINDFO, IVHICL, IRUN, ICALC, IPLACE, ITINEZ, IGOTMP, IMMRUH, LU, NUM, NONLY, NFORM, LUPRNT, ITDU, IPLI, IPL2, IPL3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMMON ALTGOD, TOTR(30), SPEED(30), TEBP(30), PEGA (0), PTG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           - INDEX IN THE ALT ARRAY OF THE TOP OF THE LAYER DAC - CONCENTRATION TO BE TESTED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                THIS SUBROUTINE CALCULATES DIFFUSION EXPONENTIALS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONNON PI, PIOVR2, P143, TWOPI, SUR2PI, DEGRAD, RADDEG, 1V2
WRITE (IPL2) -1,1,3700,6745

WRITE (IPL2,201) 125,0,0,125,81BTIM

WRITE (IPL2) -1,1,3700,6540

WRITE (IPL2) -1,1,3700,6336

WRITE (IPL2,201) 125,0,0,125,10PLAY

WRITE (IPL2,201) 125,0,0,125,00LAY

WRITE (IPL2,201) 125,0,0,125,00LAY

WRITE (IPL2,201) 125,0,0,125,00LAY

WRITE (IPL2,201) 125,0,0,125,00LAY

WRITE (IPL2,201) 125,0,0,125,0LAY

WRITE (IPL2,201) 125,0,0,125,0LAY
                                                                                                                                                                            URITE (IPL2) -1,1,5625,9000
URITE (IPL2) 1,1,6125,9000
                                                                                                                                                                                                                            (IPL2) -1,1,5025,9000
                                                                                                                                                                                                                                                                                                         URITE (IPL2) -1,1,5725,8745
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SURVEN, FILE(3)

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CLOUD STABILIZATION AND LAYER PARAMETERS
COMMON STBALT, STBATD, STBRNG, STBTIN, CLOKAD, RISTIM(30), BOTLAY,
TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, IPTZ
                                                                                                                                                                                                                                                                             COMMON BIGXO, SIGX, SIG20, SIGAF, XDIST, YDIST, EXPZ, SGSIGZ, SIGY, SIGAL, TCLMG, AVSPD, AVDIR, BIGAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                   (HEATN, VPAR(10)), (HEATM, VPAR(11)), (HEATA, VPAR(12)), (PHCL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VPAR(15)),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (PAL203, VPAR(16)), (PNO, VPAR(17)), (GAMMAX, VPAR(18))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CALCULATE THE EXPONENTIAL SUM IN THE DIFFUSION EQUATION
                                                                                                                                                                                                                                                                                                                                                                                                 EQUIVALENCE (QCI, VPAR(1)), (QC2, VPAR(2)), (QC3, VPAR(3)), (Q11, VPAR(4)), (Q12, VPAR(5)), (Q13, VPAR(6)),
                                                                                                                                                                                                                                                                                                                                                                                                                                   (AA, VPAR(?)), (88, VFAR(8)), (CC, VFAR(9)),
                                                                                                                             COMMON LTIME, LTIM, LDAY, LMONTH(2), LYEAR, LAUNTD(10)
                                                                                                                                                                                                                                                                                                                                              COMMON CONMAK, CONCPK, DOSMAK, DOSFK, RHGSHC, KNGSMD
                                                                                                                                                                                                                                                                                                                                                                                  EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS
                                                                                                                                                                                                                                                                                                                                 CONCENTRATION AND DOSAGE VALUES AND RANGES
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IF(TEXP .LE. 120.0)EMP2 = EMP2 + EMP<
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ■ EXP( - TENP2 + TENP2/SQSIG2)
                                                                                            COMMON ISTIME, ISDAY, ISHOM(2), ISYEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   - TENP3 + TENP3/SQS1G2)
                                            COMMON ITIME, IDAY, INGNINC2), IYEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  - XDIST + SIGAP + SIGZ8/1.28
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EXP = (TEMP1 - TEMP2)**2/SGSIG2
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SGSIGZ = 2.0 + SIGZ + SIGZ
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                              CALCULATION TIME
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INTEGER FILE
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C+++ CALCULATE TOTAL CLOUD LENGTH...THIS PARAMETER REPLACES CLDLNG IN COMMON C+++ CRAMER DOCUMENTAION IN ERROR...SEE STEPHENS/BJORK/HIPPS PERSONAL COFY TCLNG = 4.3 + 91GX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CONC-1000.0, DO NOT CALCULATE CROSS WIND DISTANCE BUT RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YDIST = - 2.0 + SIGY + SIGY + ALOG(15.7496 + CONC + SIGX + SIGY + SIGZ/(SIGHCL + EXP2))
                                           CC+++FOR STANDARD DEVIATION OF THE LATERAL CONCENTRATION MUST BE
                      CC••+THE DIFFERENCE IN THE WIND DIRECTIONS USED IN THE ALGORITHM
                                                            CC+++LESS THAN 180 DEGREES,.. THE FOLLOWING TWO LINES OF CURE
                                                                                                                                                                                        (0.0040589 + FLOAT(ITHET) + XDIST)++2)
                                                                                                                                                                                                                                                                                                                                                                                                                                               11 SIGX = SORT((CLDLNG/4.3)*+2 + SIGX0 * SIGX0)
                                                                                                                                                                                                                                                                                          CLDLIG = 0.29 + DELVEL + XDIST/AVSPD
IF(DELVEL .GE. 0.0)GO TO 11
IF(PTEMP(J)-PTEMP(I) .GT. 0.0)CLDLNG =
                                                                                                       CALCULATE CROSS WIND DISTANCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                YDIST - SORT(AMAXICYDIST, 0.0))
                                                                                                                                                                                                                                                                          DELVEL - SPEED(3) - SPEED(1)
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TO THE CALLING PROGRAM
                                                                                                                                                                   SIGY = SORT(SIGAL * SIGAL
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CALCULATE SIGNA Y

THIS SURROUTINE GIVES THE APPROPRIATE COMPUTABLE FOR PLATTING

SUBROUTINE ORGINCING, IYO, LYERSH)

END OF DFEXP

FORMATCEX, "TL", IX, "DELVEL", EX, "CONC", 7X, "AVSPD", 7X, "SIGAL", 7X, "SIGAP", 7X, "SIGAP", 7X, "SIGAP", 7X, "SIGAP", 7X, "SIGAP", 7X, "SIGAP", 3X, "TEMP3")
3X, "TEMP2", 3X, "TEMP3")
WRITECE, 99) TCLNG, DELVEL, CONC, AVSPD, SIGAL, SIGAP, SIGXE, 3, PTEMP(3),

RETURN TO THE CALLING PROGRAM

URITE(6,98)

FORMATCIX, OFF8.1, F6.2, 1F3E12.4, 2E12.4, 13, 0P4F8.2)

PTEMP(1), TEMP2, TEMP3

4-101

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COMMON STBALT, STBAT, STBAZD, STBATM, CLDRAD, RISTIM(30), BOTLA?
TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, IPTZ
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CLOLNG, AYSPD, AVDIR, SIGAZ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (AA VPAR(7)), (BB, VPAR(B)), (CC, VPAR(9)), (HEATH, VPAR(12)), (HEATH, VPAR(12)), (PICL, VPAR(13)), (PCG, VPAR(14)), (PCG2, VPAR(15)), (PCG2, VPAR(15)), (PCG2, VPAR(15)), (PCG2, VPAR(15)), (PCG2, VPAR(16)), (PC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COHNON ALT(30), IDIR(30), SPEED(30), TEMP(30), PRESS(30), PTEMP(30),
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMMON YPOS, YES, ISNÆFD, IVHICL, IRUN, ICALC, IPLACE, ITINEZ, IGOTNP, NUMRUN, LU, NUM, MONLY, HFORM, LUFRNT, ITDU, IPLI, IPLZ, IFL3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMMON PI, PIOVR2, FI43, TWOPI, SOR2PI, DEGRAD, RADDEG, IV2
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LOGICAL LTIME
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                VALUES AND RANGES
FOR THE COMPLEX AND MAP SELECTED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMMON ISTIME, ISDAY, ISMON(2), ISYEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONMON ITIME, IDAY, INGNTH(2), IYEAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CONCENTRATION AND DOSAGE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VEHICLE PARAMETERS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OPTION PARAMETERS
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4-102

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OUTPUT FORMAT STATFUSUL

190 FORMAT (12,1X41)

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THIS IS THE FIRST TIME THROUGH -- READ IN THE COMPLEX NUMBERS AND THE DESIRED MAP, 1.e. SEA OR LAND
                                                                                                                                                                                                                                                                                                                                                                                                                          IS THIS THE FIRST TIME THROUGH THIS SUBROUTINE? --- IF HOT, IT IS NOT HECESSARY TO CALCULATE THE INDEK OF THE
                                                                                                                                                                                                                                                                                                                                                           DATA 1X/5459,5411,4830,4825,8759,8730,4100,4100,
Uata 1y/2630,8243,2465,8050,2999,8680,1700,7300/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IF(IXC,GT,II.AND,IXC,LT.18.AND,IVHICL.EQ.1) I=3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL INC., JTVPE, 0., 0., 0, 0, 0, 31, 0, 31, 1XC, 1VC)
CALL CHARCO., VPOS, 0, IERS, 64, 0, 0)
CALL CHARC200., VPOS+16, 0, IERS, 25, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FK IXC. GT. 5. AND. 1XC. LT. 12. AND. 1VHICL. EQ. 1) 1-2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CALL CHAR(200, , YPOS+16., 0, INAPL( INP.), 12, 0, 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF(IVHICL.EQ.I) CALL DPEAD(HAME, 0.1LINE)
IF(IVHICL.EQ.2) CALL DREAD(HAME, 9.1LINE)
IF(IVHICL.EQ.0) CALL DREAD(HAMEF, 10, ILINE)
CALL LERS(YPOS, LVERSH)
                                                                                                                                                                                        2446,24,1,2844,246,246,2444,247
2441,24,8,2466,24 A,246F,24
                                                                                                                                                                                                                                   2H, L, 2HAN, 2HD , 2HMA, 2HP
                                                                                                                                                                                                                                                                        2H17, 2H, L, 2HAH, 2HD , 2HMA, 2HP
                                                                                                                                                                                                                                                                                           2N39, 2H, S, 2HEA, 2H R, 2NAP, 2H
2N39, 2H, L, 2HAH, 2HP , 2HNA, 2HP
                                                                                                                                                                                                                                                      2HIP, 2H, S, 2HEA, 2H N, 2HAP, 2H
                                                                                                                                              DATA NAMEF/2017,2415,2402/
DATA INAPL/2040,24,5,2464,24 H,24AP,24
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL CHAR( 95., YP08, 8, ILINE(7), 50, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CALL CHAR(24., YPOS, 0, ILINE(2), 8,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL CHAR( 0., YPOS, 0, ILINE, 64, 0, 0)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           . AND. IVNICL. EQ. 2) I=6
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IF(IXC,GE.6.AND,IVHICL.EQ.0) I=8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IFC IXC. GT. 17. AMP. JVH ICL. EQ. 1) 1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IF(YPOS.LT.48.0) YPOS = 458
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CALL DREAD(MAMEF, 7, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COORDINATES, 1, AGAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            1FK 1G0TMP . NE. 0 3G0 TO 7
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL LERSCYPOS, LVERSN)
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DIMENSION STATEMENT
                                         DINERSION IX(8), IY(8)
                                                                                   DATA STATEMENTS
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                                                                                                                             DATA 1ERS/32+2H
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4-103

SET THE GOORDINGTES PASED ON THE LIMPES I

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THIS SUBROUTINE READS A SPECIFIED QUESTION FROM A SPECIFIED QUESTION FILE. THE QUESTION IS THEN DISPLAYED UPON THE PLASMASCOPE FOR PROCESSING.
                                                                                                                                                                                  THIS SUBROUTINE 7LDTS A GIVEN SYNBOL & SPECIFIED WIDTH AND
                                                                                                                                                                                                                                                                                                                                                                                                                                            DIMENSION MAMER(3), IDCBK 141), IBUFK 40), ILINEK 32)
CALL OPEMK IDCB, IERR, MAMEF, 0)
                                                                                                                                       SUBROUTINE SYKBL( INIDE, IHI, ISYNB, LUPLT)
                                                                                                                                                                                                                                                          URITECLUPLT) -1,-1,IX,IY
URITECLUPLT,100> IUIDE,6.0,IHI,ISYHB
                                                                                                                                                                                                                                                                                                                                     SUBROUTINE DREAD(NAMEF, LIMM, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    READ( 18UF, 100) ( [L. INE( 1), I=1, 32)
                                                              RETURN TO THE CALLING PROGRAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CALL BLANK(IBUF,40)
CALL READF(IDCB,IERR,IBUF)
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CALL READF(IDCB, IERR, IBUF)
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IGOTHF = 1
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THIS SUBROUTINE FILLS A SPECIFIED ARRAY WITH A SPECIFIED HUMBER OF BLANKS.
                                                                                                                                                                  THIS SUBROUTINE ERASES A SPECIFIED LINE OF 64-CHARACTERS FROM THE PLASMASCOPE.
                                                                                                                                                                                                                                           IF (YPOS .GT, 48.0)GO TO 4
IF (LVERSH.EQ.0)GO TO 4
YPO3 = 458.0
CALL CLEAR
RETURN
4 CALL CHAR(0.0, YPOS, 0, IER8, 64, 0, 0)
RETURN
FILTER CHAR(0.0, YPOS-16.0, 0, IERS, 64, 0, 0)
RETURN
                                                                                                                      SUBROUTINE LERS(YPOS, LVERSN)
                                                     DINEMSTON IBUF(40)
DATA IBLK/2H /
DO 10 1=1, II
IBUF(1) = IRLK
RETURN
                                                                                                                                                                                                                        DATA IERS/32+2H /
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#### ORIGINAL PAGE POOR QUALITY

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COMMON STBALT, STBHT, STBAZD, STBRHG, STBTIM, CLDRAD, RISTIM(30), BOTLAY, TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, IPT2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DIFFUSION COEFFICIENTS
COMMON SIGKO, SIGK, SIGKO, SIGK, SIGK
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          11FC 1:03
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONNON YPOS, YES, ISMOFO, IVHICL, IRUN, ICALC, IPLACE, ITIMEZ, IGOTHP
                                                                                                                                                                                                                                                                                                                                                                                      A PROGRAM IN THE REEDS SERIES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBUH, LU, NUM, NOMLY, MFORM, LUPRAT, 1TDU, 1PL1, 1PL2, 1FL3
                                                       PROGRAM RISOS(3), REEDS ISOPLETH PLOTTING PROGRAM -- 2/3/79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (QTI, VPAK(4)), (QT2, VPAR(5)), (QT3, VPAR(6)),
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (Pril. eu 3 , Veriec 16 ) *, cerió , Veriec 17 > ) · Cariffin ?
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CONNON PI, PIOVRZ, PI43, TUOPI, SORZPI, DEGRAD, RADDEG, 192
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CAA, VPAR(7)), (BB, VPAR(8)), (CC, VPAR(9)),
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMMON COMMAX, CONCPK, DOSMAX, DOSPK, RHGSMC, RHGSMD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CLOUD STABILIZATION AND LAYER PARAMETERS
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                                                                                                                                                                                                                                                                                                                                                                                                    190PLETH PLOTTING PROGRAM --
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ERISOS T=00003 IS ON CRC0003 USING 00068 BLKS R=0000

FIND OUT IF THIS IS THE CRT OR PLASMASCOPE VERSION OF REEDS 6X"(NIN)"9X"(SEC)"9X"(NETER\$)"4X"(DEG)"6X"CROSS WIND" 4X"ALOHG WIND") DETERMINE THE ORIGIN ON THE NAP FOR THIS PLOT AND NOVE THE PEN THERE CALL GRAF TO INITIALIZE SCOPE (APPROPRIATE ONLY UNEN USING DIMEMSION CONC(10), MAME(3), MANEF(3), ILINE(32), IGATAF(10), IERS(32), IXA(100), IYA(100), IXB(100), IYB(100) DATA HAME/2H=R, ZHEE, 2HD2/, HAMEF/2H7R, 2HIS, 2H03/ (7XI3,10XF5.1,9XF8.1,4XF5.1,7XF7.1,7XF7.1) (415,14" C"A2,2XI2,1XA2,A1,1XI4) 7X"TIME FRON LAUNCH"12X"RANGE"5X"AZIMVJH" 200 FORMAT C"1"20X"CLOUD LGCATION AND DINEHSIONS"/ 204 FORMAT (415,F5,2"") 205 FORMAT (415", "F5.2"") 206 FORMAT (F5.3) 207 FORMAT (11) 208 FORMAT (415,14,1KR1,A2,2X12,1XA2,A1,1K14) TYPE AND DIMENSION STATEMENTS BX"DIAMETERS (METERS)"/ CALL ORGINGINO, IYO, LVERSH) READ COMMON DISK FILE CALL RUDISCHAME, 0) LVERSH . I .EQ. 0 (415, A1) DATA 1ER9/32\*2H PLASMASCOPE) LOGICAL DFALTC CALL VERSN(1) BEING NUM CALL GRAF(1) FORMAT(A1) FORMAT FORMAT 202 293 199 0062 0063 6900 0200 0000 0085 0083 0085 9800 0088 6800 0500 1900 6063 0664 9900 2900 000 6200 0081 2800 6600 0072 0073 4201 1075 9201 180 Ú 0092 6600 1600 0095 9600 1600 9600 0102 0103 0104 0105 0106 0106 1200 1600 700

**<b>SUIPUT FÜRHAT STATENENTS** 

DETERMINE THE INDEX IN THE ALTITUDE DATA ARRAY THAT HAS THAT ALTITUDE JUST LOVER THAN THE EFFECTIVE CLOUD HEIGHT, STBHT きゅんに おなっ (RE DEPLCTING CLAW MOSTNEHT ALAM THE SRAWM) 28 (22) AS AME CLAW STABILIZATION PATHE IFESTBAT GT. ALTC123G0 TO ISTBAT = 1 - 1 DU 4 1-2, LAYTOP dDL水管サイン 小田原はの脚 いることがい

強い 明 いたい

URITE < IPL3> -1,1,1X0,1Y0

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- RISTINGINGS * (SPEED(I) + SPEED(INI))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  .0R. 1Y.LT.0 .0R. 1Y.GT.99593GG TO 11
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SPCENT = SPEED(ISTBHI) + (SPEED(ISTBPI) - SPEED(ISTBHI)) + ARG2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CC***SINCE THE EFFECTIVE CLOUD MEIGHT IS ONLY AN ARTIFICE BASED ON CC***THE STABILIZATION MEIGHT, THE TIME TAKEN TO REACH THE EFFECTIVE CC***CLOUD HEIGHT IS THE TOTAL RISE TIME, NOT A FRACTION OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CC++*RISE TIME,..THE CODE HAS BEEN CHANGED ACCORDINGLY AFTER CONSUL-
                                                                                  DIR = 0.5 + FLOATCIBIRCI) + IDIRCIMI))
DIR = 0.5 + FLOATCIBIRCI) + IDIRCIMI) - 180.+ (1ABSC IDIRCI)
                                                                                                                                                                                                                                                                                                                                                                                                                      CALCULATIONS NECESSARY TO URITE OUT THE CLOUD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           = FLOAT(IDIR(ISTBNT)) + ((STBNT - ALT(ISTBNT))/ARGI)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RANGE - SPEENT + (RISTINCISTBF1) - RISTINCISTBHT))
                                                                                                                                                                                                                                           JECTABSCIDIRCID - IDIRCINIDO GT. 1800DIR = DIR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IF(DIR .GY. 360.0)DIR = DIR - 360.0
IF(DIR .GT. 180.0)C9 TO 17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                ALT! = 0.5 + (STBHT + ALT(1878HT))
                                                                                                                                                                                                                                                                           IF(DIR .LT. 0.0)DIR - DIR + 360.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ARG2 = (STBHT - ALT(ISTBHT))/ARGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ARGI - ALT(ISTBPI) - ALT(ISTBHT)
                                                                                                                          IF(DIR .LE. 0) DIR = DIR + 360
DIR = DEGRAD+DIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CC+++TATION WITH DR. STEPHENS...JSH
                                                                                                                                                                                                    - DIR
                                                                                                                                                                                                                   - DIR
                                                                                                                                                                                                                                                                                          DIR = DECRAD * (360.0 - DIR)
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                                                                                                                                                                                                                                                                                                                                                  - INTCO.2631 + X) + IXO
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                                                                      * (RISTIN(I)
                                                                                                                                                                                                                                                                                                                       + RAMGE + COSCDIR)
                                                                                                                                                                                                                                                                                                                                    - Y + RANGE + SINCDIR)
                                                                                                                 - IDIR(IRI)>/180>
                                                                                                                                                                                                   * X + RANGE * COS(PI
                                                                                                                                                                                                                                                                                                                                                                                           WRITE (IPL3) 1,1,1X,1Y
                                                                                                                                                                        IFCOIR GT. PI) IFLIP
                                                                                                                                                                                       DIR - DIR + IFLIF+FI
                                                                                                                                                                                                                               - SORTCX+X + Y+Y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ISTBP! = ISTBHT + 1
                                                                                                                                                                                                                                                                                                       . DEGRAD . DIR
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                                           DO 9 1=2,1STBHT
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IN THE FOLLOWING DO LCOP, "STBRNG IS THE DISTANCE FROM THE PAD TO STABILIZATION, AND "R" IS THE DISTANCE FROM THE PAD XDIST IS THE DISTANCE FROM THE STABILIZATION POINT.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      URITE (6,666) XDIST
FORMAT(* THE DISTANCE FROM STABILIZATION IS:",F12.2:
URITE (LUPRHT,201) ITIM,RE,R,AZ,DACRS,DALHG
XDIST = XDIST + DELR
TIM = TIM + 5.0
TIM = TIM + 360.0
                                                                                                                                                                                                                                                                                                                                                                INITIALIZE SOME QUANTITIES FOR THE SUBSEQUENT DO LOOP
                                                                                                                                                                                                                                                                                                                                                                                        IDELTH = IABS(IDIR(LAYIOP) - IDIR(1))
IF(IDELTH.GE,180)IDELTH = 360 - IDELTH
                                                                                                                                                                                                                                                                                   - 180.0
                                                                                                                                                                                                                                                                      - AVDIR
                                                                                                                                                                                                                                                                                                                                                                                                                                 DELU - ABS(SPEED(18TBHT) - SPEED(1))
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                                                                                                                                                                                                                              IFCAVDIR .GT. 180.03ARG1 = 540.0
                                                                                                                                                                        IF CANGL .GT. 188, 0 JARGI - 540.0
                                                                                                                                                                                                                                                     ARG! = DEGRAD + DAZ
IF(AVDIR.GE.90.0) DAZ = 190.0 -
IF(AVDIR.GE.180.0) DAZ = AVDIR
IF(AVDIR.GE.270.0) DAZ = 360.0
                       ARGI = DEGRAD = DIR
X = X + RANGE + COS(PI - ARGI)
Y = Y + PANGE + SIN(PI - ARGI)
IF(DIR.GT.188.0) FLIP = -1.8
DIR = DIR + FLIP + 180.0
                                                               R = SQKT(X + X + Y + Y)
DELR = 300.0 +6VSPD
                                                                                                                                                                                                                                                                                                                      DELX * DELR * COSCARGE)
DELY * DELR * SINCARGE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TXL = 4.28 + DELU/AYSPD
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SIGNIZ = SIGNI, + SIGNI
                                                                                          DACR'S = 4.30 + SIGNO
DALHG = 4.30 + SIGNO
                                                                                                                                                                                                                                                                                                          ARGI - DEGRAD + DAZ
                                                                                                                                            = AHGL + RAPUEG
= 180.6
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RE = AMOD(TIM,60.0)
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                                                                                                                                AHCL = ATAN2(Y,X)
                                                                                                                                                                                     AZ = ARGI - AMGL
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IY = INT(0.3545 + Y) + IY0
IF(IX.LT.0.0R. IX.GT.9999.0R. IY.LT.0.0R. IY.GT.9999)G0 T0 77
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                                                                                           SIGAL2 = (SIGAP+KDIST + SIGKO)++2
SIGY = SQRT(SIGAL2 + (0.0040589 + FLOAT(IRELTH) + KDIST)++2)
                                            CC+++ALGORITHM FOR SIGY FOUND IN SUBROUTINE DFEXP AFTER CONSUL-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DRAW THE LINE OF CLOUD MOVEMENT ALONG THE GROUND FROM
                            CC+++THE ALGORITHM FOR SIGY HAS BEEN CHANGED TO CONFORM TO THE
                                                                                                                                                                                                                                                                                                                                                                                  3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ARE DEFAULT CONCENTRATION VALUES GOING TO BE USED
                                                                                                                                                                                                                                                                                                                                                                               LABEL THE POINT OF MAXIMUM CONCENTRATION UITH A
                                                                                                                                                                                                                                                                                                                                                                                                                                                        IX! = INT(0,2631 + (X + RHGSHC + CDIR)) + IX0
IY! = INT(0,3545 + (Y + RHGSHC + SDIR)) + IY0
WRITE < IPL3) -1,1,1X1,IY1
                                                                                                                                                                                                                    LABEL THE CLOUD STABILIZATION POINT WITH A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IFCYPOS.LT.48.0 AND. LVERSK) YPOS = 458.
CALL DREAGCHAMEF,2,ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     THE CLOUP STABILIZATION POINT ON
                                                                                                                                                                                       AZ = 180.0 - RADDEG + ATAM2(YC, XC)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CALL CHARCO, YPOS, 0, 1LINE, 64, 0,0)
YPUS = YPOS - 16.
                                                                                                                                                                                                                                                                                                                                                                                                              - DEGRAD + (180.0 - AVDIR)
                                                           CC+++TATION UITH DR. STEPHENS...JSH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CALL SYNBL(150,150,110,1PL3)
                                                                                                                                                                                                                                                                                                                                                CALL SYMBL(150,156,1H+,1PL3)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IF(YPOS,LT,48.0) YPOS = 458.
                                                                                                                                                                      R = SURT(XC + XC + YC + YC)
                                                                                                                                                                                                                                                 - INTC 0.2631 + X> + 1X0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IX = INT(0.2631 + X) + IX0
IY = INT(0.3545 + Y) + IY0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IFCIX.LT.0 . OR. IX.GT.9999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DREADCHAHEF. 3 ILINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WRITE (IPL3) -1,1,1XX, ETY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              UKITE (IPL3) -1,1,1XX,1YY
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Y = Y + RANGE + SPIR
                                                                                                                      DACKS = 4.36 + SIGY
XC = XC + DELX
YC = YC + DELY
DALNG = 4.30 + SIGX
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SDIR = SINCDIR)
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DO LOOP OVER THE 10 POSSIBLE CONCENTRATION VALUES FOR THE PLOTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IF DEFAULT CONCENTRATION VALUES ARE NOT BEING USED,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IF(1X .LE. 25)CALL CHAR(464.,YPOS,0,TERS,6,0,0)
IF(1X .GT. 25)CALL CHAR(384.,YPOB,0,TERS,8,0,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                     CALL IN(1, JTYPE, 0., 0., 0, 0, 0, 31, 0, 31, IX, IY)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             YPOS = YPOS - 32.
IF(YPOS .L.T. 64.0)YPOS = 458.0
IF(YPOS .L.T. 64.0 .AND. LVERSH)YPOS = 458.0
                                                                                                                                                              CALL CHAR 440., YPOS+48., 0, 1041AF, 5, 0, 0)
                                                                                                                                                                                                                                                    CALL CHAR(256., YPOS<32., 0, IDATAF, 3, 0, 0)
                                                                                                                                                                                                             CALL CHAR(120., YPOS+32., 0, IDATAF, 5, 0, 0)
                                                                                                                                                                                                                                                                                                                  COLL CHAR(384., YPOS, 0, ILINE(25), 8,3,0)
Call Char(464., YPOS, 0, ILINE(30), 6,0,0)
IF(LVERSN) GO TO 33
                                           -- SET UP THE DEFAULT VALUES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   READ IN THE VALUE FOR THIS PLOT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DALL SHARK 0., YPOS, 0, ILINE, 64, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL CHAR(0,,YPOS,0,ILINE,72,3,0)
CALL CODE
                                                                                                                                                                                                                                                                                                   CALL CHAR( 6., YPOS, 0, ILINE, 46, 3, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CALL DREAD(HAMEF, 5, ILINE)
CALL LERS(YPOS, LVERSH)
CALL CHARK 0., YPOS, 0, ILINE, 64, 0,0)
YPOS = YPOS = 32.
CALL CHARCO, , YPOS, 0, ILINE, 64, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FCIX .LT. 20)DFALTC - .TRUE,
                                                                                                                                                 URITE (IDATAF, 206) CONC(I)
                                                                                                                                                                                             URITE (1DATAF, 206) CONC(2)
                                                                                                                                                                                                                                        URITE (10ATAF, 206) CONC(3)
                                                                                                                                                                                                                                                                       CALL DREAD(NAMEF, 4, ILINE)
CALL LERS(VPOS, LVERSH)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CALL DREAD(HAMEF, 6, LINE)
CALL LERS(YPOS, LVERSH)
                                                                                                                                                                                                                                                                                                                                                                                            IF CIANS . NE . IHN ) GO TO 34
                                                                                                     CONC(3) = 0.75 + COMMAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IF(YPOS.LE.64) YF05=458
                                                                        CONC(1) = 0.1. + CONMAX CONC(2) = 0.5 + CONMAX
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF(DFALTC)GO TO 35
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             YPGS - YPOS - 32.
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IX = 25
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                                                                                                                 CONC(4) = 1.0
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                                                                                                                                    CALL CODE
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IY = IHT(0.3545 + (XDIST + SDIR + YDIST + CDIR)) + IYY
IF(IN.LT.0 .0K. IX.GT.9999 .0R. IY.LT.0 .0K. IY.GT.9999)GO TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IX = INTCO.2631 + (XDIST + CDIR + YDIST + SDIR)) + IXX
IY = INTCO.3545 + (XDIST + SDIR - YDIST + CDIR)) + IYY
IFCIX.LT.O.0R, IX.GT.9999 .OR. IY.LT.Q.0R. IY.GT.99993GO TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    .OR. 17.GT.99993G0 TO
                                     CALL 1H(0, JIYPE, 144., YPGS, 0, 16ATAF, HIH, 0, 31, 0, 31.1X, 1Y)
                                                                                                                                                                  ITERATE TO FIND THE LOCATION OF THIS CONCENTRATION
                                                                                                                                                                                                                                                                                                                                                                                                                                        PLOT OUT THE CONCENTRATION LINE ON BOTH SIDES
                                                                                                                             458.0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                           * XDIST * CDIR) + 1XX
* XDIST * SDIR) + 1YY
                                                                                                      IF(YPOS .LT. 40.0)YPOS = 458.0
IF(YPOS .LT. 40.0 .AND. LVERSH)YPOS
IF(COHC(I) .LT. 0.0)GO TO 61
                                                                         CALL CHARCO., YPCS, 6, ILINE, 17, 0, 0)
CALL CHARCIII., YPUS, 0, IDX, 1, 0, 0)
YPOS = YPOS - 16.
CALL CHARCITL, YFGS, 0, 10X, 1, 3, 0)
                                                                                                                                                                                                                                                                                                            IF(DINC .LE. 100.00G0 TO 43
                                                                                                                                                                                                                                           CALL DFEXP(LAYTOP, CONC(1))
IF(YDIST ,GT, 0,0)G0 T0 42
XDIST = XDIST + DINC
                                                                                                                                                                                                                                                                                                                                                                         IF(DINC .LE. 10,0360 TO 44 XDIST = XDIST = 90.0
                                                              READ (IDATAF, *) CONC(1)
                                                                                                                                                                                                                                                                                                                      XD1ST - XD1ST - 900.0
                         CALL BLANK( IDNTAF, 10)
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IYACHUMA) = IY
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IYB(HUMB) = 1Y
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IYACHUMA) = IY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WRITE (IPL3) -1,1,1869,319
Write (IPL3,202) 100,0,0,150,ITIME,LAMITD:4),IDAY,IMCHTH,IYEAR
                                                                                                                                                                                                                                                     IX = INT(0.2631 + (XDIST + CDIR + YDIST + SDIR)) + IXX
IY = INT(0.3545 + (XDIST + SDIR - YDIST + CDIR)) + IYY
IF(IX,LT,0.0R, IX,GT.9999, OR, [Y,LT,0.0R, IY,GT.9999)G0 TO
                                                                                      IF(IX,LT.0 .0P. 1X.GT.9999 .0R. IY.LT.0 .0R. IY.GT.9999)GO TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CH THE FLOT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IFC.NOT, LTIME)GD TO 67
WRITE (IPL3) -1,1,1869,112
WRITE (IPL3,208) 100,0,0,150,LTIM,LAUNTG(3),LAUNTG(4),LOAY,LOAY,
                                                       IX = INT(0.2631 * (XDIST * CDIR - YDIST * SPIR)) + IXX
IY = INT(0.3545 * (XDIST * SDIR + YPIST * CDIR)) + IYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IF THE LAIMCH TIME WAS ENTERED, PRINT IT OUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRINT OUT THE PREDICTION TIME ON THE PLOT
                                                                                                                                                                                                                                                                                                                                                                                                         URITE (FPL3) 1,1,1MA(J),1YA(J)
IF(NUMB ,EP, 1)GO TO 59
URITE (IPL3) -1,1,1MB(1),IYB(1)
                                                                                                                                                                                                                                                                                                                                                                           (1PL3) -1,1,1XA(1),1YA(1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   URITE (1FL3) 1,1,1XB(J),1YB(J)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WRITE ( IPL3) -1,1,1041,1342
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WRITE (IPL3) -1, ,, 1269, 604
URITE (IPL3) 1,1,1760, 604
                                            CALL DFEXP(LAYTOP, CONC(1))
                                                                                                                                                                 . 0.6)GO TO 52
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         JE(JSNDFO ,NE, 6)GO TO 62
WRITE (JPL3) -1,1,707,604
WRITE (JPL3) 1,1,1174,604
GO TO 64
                                                                                                      HUMA . MUMA + 1
                                                                                                                                                                               HUMB = HUMB + 1
                                                                                                                                                                                                                                                                                                    HUMB .. HUMB + 1
                                                                                                                   IXACHUMA) = IX
IYACHUMA) = IY
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IYBCMMB) = IY
                                                                                                                                                                                           IXBCHUMB) = IX
IYBCHUMB) = IY
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17E(HUMB) = 1Y
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FOR THE LEGEND ON THE PLOT, PRINT OUT THE CONCENTRATION VALUES FOR WHICH CONTOURS WERE DRAWN
                                                                                                                                                                                           CALL NGRAF TO RETURN SCOPE TO NORMAL MODE OF OFERATION CAPPROPRIATE ONLY WHEN USING PLASMASCOPE)
                                                               URITE (1PL3) -1,1,1066,9567

60 75 1=1,10

1F(CONC(1) .LT. 0,6560 TO 77

1F(1 .NE. 1)60 TO 72

URITE (1FL2,204) 125,0,0,150,CONC(1)

60 TO 73
                                                                                                                          USITE (IPL3,205) 125,0,0,150,CONC(I)
                                                                                                                                                                                                                                             RETURN TO THE MAIN PROGRAM REEDS
WRITE (IPL3,203) 150,0,0,150,1H+
WRITE (IPL3) -1,1,1041,1104
URITE (IFL3,203) 150,6,0,150,1H0
                                                                                                                                                       URITE OUT COMMON DISK FILE
                                                                                                                                                                             77 CALL RUDIS(NAME, 1)
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CLOUD STABILIZATION AND LAYER PARAMETERS COMMON STBALT, STBHT, STBAZD, STBRNG, STBTIM, LLUKAD, RISTIM(30), BOTLAY, TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, 1PTZ CONNOM SIGKO, SIGK, SIGZO, SIGNP, KDIST, YDIST, EXPZ, SASIGZ, SIGY, SIGAL CHEATH, VPARC 1937, CHEATH, VPARC 1137, CHEATH, VPARC 1237, CPHCL, VPARC 1232, CPCB, VPARC 1437, CPCB2, VPARC 1537 COMMON ALT(30), IDIR(36), SPEED(30), TEMP(30), PRESS(30), PTENP(30), OPTION PARAMETERS COMMON YPOS, YES, ISMOFO, IVHICL, IRUN, ICALC, IPLACE, ITIMEZ, IGOTMP NUMRUH, LU, NUM, NOMLY, NFORM, LUPRNT, ITOU, IFLI, IPL2, IPL3 CPAL 203, VPARC 1600, CPHB, VPARC 1700, PARCHARY SPARC EQUITORLENCE (961, VPAR(1)), (962, VPAP/2)), (963, VPHR(3)), (911, VPAR(4)), (912, VPAR(5)), (913, VPAR(5)) CONMON PI, PIOVR2, P143, TWOPI, SOR2PI, DEGRAD, RADDEG, 1V2 (AA, VPAR(7)), (88, VPAR(8)), (CC, VFAR(9)), CONNON LTIME, LTIN, LOAY, LHONTIK2), LYEAR, LAUNTDC 10) EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS COMBON COMMAX, CONCPX, DOSNAX, DOSPX, RHGSHC, RHGSMD AND URITES COINCIS AREAS ROMCENTRATION AND DOSAGE VALUES AND RANGES TO BE UTILIZED BY THE VARIOUS REED PROGRAMS RRISOT 1-44003 IS ON CROGGG USING 00162 BLKS R-0000 COMMON ISTINE, ISDAY, ISMUNC2), ISYEAR COMMON ITIME, IDAY, IMONTH(2), IYEAR CLDLNG, AVSPD, AVDIR, SIGAZ INTEGER OPCRO144), (BUF (557) DIFFUSION COEFFICIENTS SUBROUTINE READS SUBROUTING RUDISCHANE COMMON VPARK 18), SIGHCI SURFER, FILE(3) VEHICLE PORMETERS CALCULATION TIME MATH PARAMETERS SOUNDING TIME COMMON ARFAS LAUNCH TIME LOGICAL LTINE INTEGER FILE HET DATA INTEGER YES THIS  $\hat{\hat{x}}$ ~  $\hat{\hat{z}}$ ? ?  $\hat{\hat{z}}$ <u>^</u> ? 念个 **六**へ Ç Ç ပ ن ပ 0020 6100 0.029 8200 0039 3100 1000 7100 9100 8100 0023 0024 0025 1200 9890 6033 9600 0045 2700 0053 9000 8000 2100 0013 0022 9626 10034 0035 7500 9148 6400 9629 0052 0000 6000 5196 0021 0028 6632 0046 0051 4000 0955 4-115

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SURDEN, FILE(3)
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                          CALL OPENCOCE, IFRR, MANE, 9)
IFCTERR .LT. 0.CALL CREATCOCE, IERR, MANE, 14,3,0,0,144)
IFCJJ.EJ. FOCALL URITFCOOCE, IERR, OBUF, 557)
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CALL CLOSECOOCE, IERR,
                                                                                                                                                                                                                OF THE LAYER
                                                                                                                                                                                                                                                                                                                                              COMMON PI, PIOVRZ, PI43, TWOPI, SORZPI, DEGRAD, RADDEG, IVZ
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EQUIVALENCE (QC1, VPAR(1)), CQC2, VPAR(2)), CUT 3, VP3R(3), CQT1, VPAR(4)), CQT2, VPAR(5)), CQT2, VPAR(5)), CQT3, VPAR(6)), CC1, VPAR(6)), CC2, VPAR(6)), CC2, VPAR(6)), CC3, VPAR(1)), CQC1, VPAR(12)), CQC1, VPAR(12)), CQC1, VPAR(12)), CQC1, VPAR(12)), CQC1, VPAR(13)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(15)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(14)), CQC1, VPAR(15)), CQC1, VPAR(15), CQC1, VPAR(15), CQC1, VPAR(
                                                                                                                                                                                                 (PAL 203, VPAR(16)), (PHG, VPAR(17)), (CANHAX, VPAR(18))
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CC***ERENCE IN THE DIRECTIONS IS ALWAYS LESS THAN 180 DEGREES.
CC
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ENUIVALENCE STATEMENT FOR YENICLE PARAIIFTERS
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C*** CALCULATE TOTAL CLUUD LEHGTH...THIS PARMETER REFINES CLOLNG IN COMMUNIC.*** CRAHER DOCUMENTATON IN ERROR...SEE STEFHENS/BJUFF/HIFFS PERSONAL COFF
TCLNG = 4.3 * SIGX
                                                                                                                                                                                                                                                                                                                                                                    Į
                                                  IF CGNC-1900.0, DO HOT CALCULATE CRÔSS WIND DISTANCE BUT RETURN
TO THE CALLING PROGRÂM
                                                                                                                                                YDIST = - 2.0 + SIGY + SIGY + ALOG(15,7496 + CONG + SIGX + SIGY + SIGZ-(SIGHCL + EMP2))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CONMON ALT(30), IDIR(30), SPEED(30), TENP(30), PRESS(30), FTENP(36), SURDEH, FILE(3)
                                                                                                                                                                                                                                                                                                                                                                    THIS SUBROUTINE GIVES THE APPROPRIATE COORDINATES FOR PLOTTING FOR THE CONFLEX AND MAP SELECTED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      "HISL, IRUH, ICALC, IPLACE, ITINEZ, IGOTNP, " ?, NFORM, LUPRNT, ITDU, IPL1, IPL2, IPL3
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                                                                                                                                                                                                                                                                                                                SUBROUTINE ORGINCING, IND, LVERSH)
                                                                                                                         CALCULATE CROSS WIND DISTANCE
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                                                                                                                                                                            YDIST - SORT(AMAXICYDIST, 0,0))
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CEOUD STABILIZATION AND CAYER PARAMETERS COMNOW STBALT, STBHT, STBAZD, STBRNG, STBTIM, CLDRAD, RISTIM(30), BOTLAY COMMON SIGKO, SIGK, SIGZO, SIGAP, XDIST, YDIST, EXPZ, SQSIGZ, SIGAL THE FIRST TIME THROUGH -- READ IN THE COMPLEX NUMBER (HEATH, VPAR(10)), (HEATH, VPAR(11)), (HEATA, VPAR(12)), (PAL203, VPAR(16)), (PNO, VPAR(17)), (GAHMAX, VPAR(18)) DIHENGIOH ILINE(32), IDATAF(10), IERS(32), IMAPL(48), MAMEF(3) NOT, IT IS NOT NECESSARY TO CALCULATE THE TIDEX OF THE (PHCL, VPAR(13)), (PCO, VPAR(14)), (PCO2, VPAR(15)), EQUIVALENCE (QC), VPAR(1)), (QC2, VPAR(2)), (QC3, VPAR(3)), (Q11, VPAR(4)), (Q12, VPAR(5)), (Q13, VPAR(6)) (AA, VPAR(7)), (BB, VPAR(8)), (CC, VPAR(9)), IS THIS THE FIRST TIME THROUGH THIS SUBROUTINE? IF NOT, IT IS NOT NECESSARY TO CALCULATE THE IM CONNEN LTINE, LTIN, LDAY, LMONTH(2), LYEAR, LAUNTD(10) DATA IX/5450,5411,4030,4825,8750,8730,4100,4100/ DATA 17,72630,8243,2465,8050,2990,8600,1700,7300 CONHON CONNAX, CONCPK, DOSMAX, DOSPK, RNGSMC, RHGSMP EQUIVALENCE STATEMENT FOR VEHICLE PARAMETERS CONCENTRATION AND DOSAGE VALUES AND RANGES TOPLAY, CALHT, LAYTOP, LAYBOT, REFLEC, 1PTZ DATA MAMEF. 2478, 2415, 2402 /
DATA IMAPL. 2440, 24, 8, 2464, 211 M, 2410P, 24, 1
2440, 24, L, 2410M, 24D , 2410M, 24P ,
2441, 24, 9, 24164, 24 M, 2410P, 24 ,
2417, 24, S, 2416, 24 M, 2410P, 24 ,
2417, 24, S, 2416, 24 M, 2410P, 24 ,
2417, 24, L, 241M, 240 , 2410P, 24 ,
2417, 24, L, 241M, 240 , 2410P, 24 , AND THE DESIRED MAP, I.R. SEA UR LAND 2H39, 2H, L, 2HAH, 2HD , 2HHA, 2HP CLDLHG, AYSFD, AVDIR, SIGAZ **OUTPUT FORMAT STATEMENT** DIFFUSION COEFFICIENTS CALL DREAD(HAMEF, 7, ILINE) INPUT FORMAT STATEMENT COORDINATES, I, AGAIN IFCIGOTAP .NE. 03GO TO 7 DIMENSION STATEMENT DIMENSION 1X(8), 1Y(8) DATA STATEMENTS 100 FORMAT (12,1XA1) DATA 1683/32+2H DATA LCHAR/IHL/ LOGICAL LIINE THIS IS ? ? ?  $\stackrel{\wedge}{\sim}$ ပ ပ Ç U ပ ပ C ť ပ Ü 0000 S S 259 0.580 260 263 1264 265 0269 1270 1276 1282 1283 284 0285 9870 0295 0298 6241 1250 253 255 257 1262 0267 0268 0273 1274 275 0277 201 0287 0288 0289 0290 6292 0293 9520 0297 0291 0294 234 251 261 127 4-119

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                                                                                                                                                      CALL INK!, JTYPE, 0., 6., 0.0, 0.0, 31, 0,31, 1XC, 1YC)
CALL CHARK 0., YPOS, 0, IERS, 64, 0, 0)
CALL CHARK 200., YPOS+16, 0, IERS, 25, 0, 0)
IFK IXC. LT. 6. AND. IVHICL. EQ. 1) 1=1
IFK IXC. CT. 5. AND. IXC. LT. 12. AND. IVHICL. EQ. 1) 1=2
IFK IXC. GT. 11. AND. IXC. LT. 18. AND. IVHICL. EQ. 1) 1=3
IFK IXC. GT. 17. AND. IVHICL. EQ. 2) 1=4
IFK IXC. CT. 6. AND. IVHICL. EQ. 2) 1=6
                                                                                                                                                                                                                                                                                                                                     CALL CHAR(208., YPOS+16., 0, IMAPL(IMP), 12, 0, 0)
                                                                                                                                                                                                                                                                                                                                                                                                             SET THE COORDINATES BASED ON THE INDEX 1
        TCLL CHAR(0., YPOS, 0, ILINE, 64, 0, 0)

YPOS = YPOS - 16.

IF(LVERSH.EQ.0)GO TO 10

IF(YPOS.LT.40.) YPOS = 458.

IF(IVHICL.EQ.1) CALL DREAD(MAMEF, 9, ILINE)

IF(IVHICL.EQ.2) CALL DREAD(MAMEF, 9, ILINE)

IF(IVHICL.EQ.0) CALL DREAD(MAMEF, 10, ILINE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SUBROUTINE SYMBL(SUIDE, INT, ISYMB, LUPLT)
                                                                                                                                            CALL CHAR( 95., YPOS, 0, ILINE( 7), 50, 0, 0)
                                                                                                                               CALL CHAR(24., YPOS, 0, ILINE(2), 8,3,0)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WRITECLUPLT) -1,-1,TX,TY
WRITECLUPLT,100) TWIDE,0,0,THI,1SYNB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RELOAD PAD INDEX FREYTOUSLY COMPUTED
                                                                                                                                                                                                                                                                                     RETURN TO THE CALLING PROGRAM
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                                                                                                                                                                                                                                                                                                                                                                                 IF(YPOS .LT.48.) YPOS = 458.
                                                                                                                                                                                                                                                                                                                                                                 IF(LVERSH.EQ.0)GO TO 6
                                                                                                               CALL LERSCYPOS, LVERSN)
CALL LERS(YPOS,I.VERSH)
CALL CHAR(0.,YPOS,0,IL
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THIS SUBSOUTINE PEADS A SPECIFIED QUESTION FROM A SPECIFIED OVERTION FILE, THE QUESTION IS THEN DISPLAYED UPON THE PLASMASCOPE FOR PROCESSING.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         THIS SUBROUTINE ERASES A SPECIFIED LINE OF 64-CHARACTERS
                                                                                                                                                                                                                 DIMENSION MANEF(3), IDCBC144), IBUFC40), ILINEC32)
Call Opencidos, Ierr, Manef, 0)
                                                            SUBROUTINE DREAD(HAMEF,LHUM, ILINE)
                                                                                                                                                                                                                                                                                                                                                                      (EADCIBUF, 100) (ILINE(1), I=1,32)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SUBROUTINE LERSCYPOS, LVERSN)
                                                                                                                                                                                                                                                                              CALL BLANK(IBUF,40)
CALL READF(IDCB, IERR, IBUF)
                                                                                                                                                                                                                                                                                                                       CALL BLANK(184F, 40)
CALL READE(1DCB, IERR, IBUE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DATA 1ERS/32-2H /
IFCYPOS .GT. 40.0.CO TO 4
IFCLVERSH.EG.0.XCO TG 4
VPOS = 459.0
CALL CLEFF
PETUFH
                                                                                                                                                                                                                                                                                                                                                                                                                                               SUBROUTINE BLANK(1BUF, 11)
               WRITEKLUPLTS-1,-1,1X,1Y
                                                                                                                                                                                                                                                                                                                                                                                                 CALL CLOSE( 16CB, 1ERR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FROM THE PLASMASCOPE.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           HUMBER OF BLANKS.
                                                                                                                                                                                                                                                .06P - LHUM - 1
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                                                                                                                                                                                                                                                             DO 10 1=1, LOOP
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                                                                                                                                                                                                                                                                                                                                                                                     FORMAT(32A2)
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                                                                                                                                                                                                                                                                                                                                                         CALL CODE
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                                RETURNS
  17=-17
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4 CALL CHAR(8.8, 7PGS, 6, 1ERS, 64, 8, 8) CALL CHAR(6.6, 7PGS-16.6, 6, 1ERS, 64, 6, 0) Return End End

6426 6421 6421 0423

4-122

#### 4.2 <u>AUXILIARY SUBROUTINE LISTINGS</u>

This section contains the current REEDS apply lary subroutine listings. They are listed according to the sequence indicated. Section 4.0.

3\_ ... 11t... GRAPHICS \*CAB, 81 0313 HULT - POSITIVE INTEGER INDICATING THE NUMBER OF UNITS THE THE TOTAL THE THIRT THE THE THE THE THE THE THE THE PERSON OF HULL, I.E. THIS ROUTINE DUFLICATES THE FUNCTION OF THE WAIT SUBROUTINE FOUND IN THE ISA LIBRARY. THE INPUT VARIABLES ARE DEFINED SUBROUTINE CHARCK, Y, 1XY, ICHAR, NCHAR, NUDE, 1ALT) 1FCHODE .EQ. 3)GO TO 25
WRITE <LU,200) IX, IY, CCHCUT(1), I\*i, HWDRDS)\* CRT WRITE (LU, 201) IX, IY, CCHGUT(1), I=1, HUORDS) LCTLB2 1=60663 IS GN CR66663 USING 66015 BLKS R=0060 200 FORMAT ("Eta"12"C"12"REGAO"32A2) 201 FORMAT ("Eta"12"C"12"REGAOB"32A2"EGAO") REEDS SUBROUTINE UAITCHULT, IRES, IERR) COMMON IDUNC645, LU, IDUNIC4925 COMMON IDUM 64), LU, IDUMI (492) = 31 - INT(0.0625 + Y) INTEGER BLANKS, CHOUT (32) EIMENSION ICHAR(1) IFKNODE .NE. 13G0 TO 15 7 NUGRDS = CHCHAR -- 13/2 SUBROUTINE GRAFCILOCK) 1F(1XY .GE. 0)GO TO 2 1X = INT(X) 1Y = 31 - INT(Y) GO TO 7 SUBROUTINE DELAY(SEC) HSEC = 1000.0 \* SEC - INT(0,125 + X) CHOUT(1) = 1CHAR(1) CHOUTE 1) = BLANKS CALL WAIT (NSEC, 1) DATA BLANKS/2H / DO 12 1=1,1HUGRDS DO 16 I=1, HWORDS SUBROUTINE CLEAR URITE (LU,200) Call Delay(0.1) Return SUBROUTINE NGRAF CALL DELAY(0.1) AS FULLING 200 FORMAT ("EE") CO TO 19 RETURN RETURN RETURN ENC 2 23 ن 0035 0049 0050 0051 6000 6013 0025 0026 602B 0029 0036 0032 0033 0034 6036 6200 0100 0042 0043 1100 0045 0046 0048 6652 0.053 0.054 0000 000 6612 6624 0037 0047 0002 £900 1900 0002 9000 0000 6011 E199 0015 0021 0023 0027 6031 0041 **0018** 7100 4-124

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SUBROUTINE INCITYPE, JTYPE, X, Y, EXY, ICHAR, HCHAR, IXL, IXH, IYL, IYH,
                                                                                                                        FCMIN.T.GT.0 , AND, TRES, GE.0 , AND, TRES.LE. 3360 TO 4
                                                                                                                                                                                                                                                                                                                                                                                                 DATA UPB/030006B/, UF9/034400B/, UPBL/020008/,
LGUE/00066B/, LGU9/000071B/, LGUEL/000646B/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               9 IFCIXIP.GE.UPB. AMD. IXUP.LE.UP3 .MIN. . IXLOW.GE.LOWB.AMD. IXLOW.LE.LOW9.50 TO 12
10'S OF MILLISECONDS
                                                                           1 - REQUEST ACCEPTED
3 - ILLEGAL PARAMETER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IFCIX.GE.IXL . AND. IX.LE.IXH)GO TO 15
  0 - 10'S OF MILL
I - MILLISECONDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                           INVORDS = (HCHAR - 13/2 + 1
READ (LU,100) (ICHAR(1),I=1,HAGRDS)
IF(ITYPE ,EQ. 0)RETURN
                           2 - SECONDS
3 - NIMUTES
1ERR - RETURNED ERPOR FLAG
                                                                                                                                                                                                                                                                                                                       COMMON IDUMC 643, LU, IDUMIC 4923
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IXUP = IAHD(IXIN,177400B)

IFCIKUP, EQ. UPBL)IXUP = UPB

IXLOW = IAHDCIXIN,000377B)

IFCIKLOW - NE. LOWBL)GO TO 9

IXLOW = ISHIFCIXUP,8)
                                                                                                                                                                                             IF IRES .EQ. 1) IN = IM/10
IR = IRES
IF (IRES .EQ. 0) IR = 1
CALL EXEC(12,0, IR,0,-IN)
                                                                                                                                                                                                                                                                                                                                                                                                                                               IFCITYPE .EQ. 1360 TO 4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IFCITYPE .EG. 2)RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IFCITYPE . EQ. 23RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IXIN - 10RC IXUP, IXLOW)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUBROUTINE VERSM IVER
                                                                                                                                                                                                                                                                                                                                                                      INTEGER UP . UP 9, UP &L
                                                                                                                                                                                                                                                                                                                                                                                    DIMENSION ICHAR(1)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         READ (LU, 100) IXIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         READ CIXIN, 101 > 1X
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IXIN - ICHAR(I)
                                                                                                                                                                                                                                                                                                                                                    FORMAT (12)
                                                                                                                                                                                                                                                                                                                                                                                                                              JIYPE - 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GD TO 4
JTYPE - 1
                                                                                                                                                                                  IN - MULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CALL CODE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IVER = 1
SETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CO TO 2
                                                                                                                                                      RETURN
                                                                                                                                                                                                                                                             RETURN
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*CAB, 61 6815
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SUBROUTINE CHARCCX, Y, IXY, ICHAR, NCHAP, NODE, IALT)
                                   SUBROUTINE CHARKY, Y, 1XY, ICHAR, HCHAR, HODE, ISIZE)
                                                PLOTTER GRAPHICS
4ML162 T=00003 15 OH CROGOGJ USING 00018 BLKS R=0000
                                                                                                                                                                                                                                   DIMENSION X(1),Y(1)

IF(NXY.LT.2 .OR. NOOE.NE.@)RETURN

KX = X(1)/51.2

YY = Y(1)/51.2
                                                                                                                                                                        IFCISIZE.EQ.() SIZE = SIZE/1.5
CALL SYNB(XX,YY,SIZE,JCHAR,0.,()
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   FURNAT < "[4a"14"c"14"RtadB"3242)
                                                           COMMON IDUM(64), LU, IDUMI(492)
DINENSION ICHAR(32), JCHAR(33)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COHMON IDUNC 643, LU, IDUNIC 4923
                                                                                                                                                                                                                       SUBROUTINE LINECK, Y, NXY, HODE)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CONNOH IDUNC 640, LU, IDUNIC 4920
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FORNAT < "E4a"14"c"14"R"32A2)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUBROUTINE LALT(11,12,13)
                                                REEDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTEGER BLANKS, CHOUTC32)
                                                                                                          DO 5 K=2,33
JCHAR(K) = ICHAR(K-1,
XX= X/51.2
YY= Y/51.2
                                                                                    IF(MODE .EQ. 1)KETURH
JCHAR(1) = MCHAR
                                                                                                                                                                                                                                                                                                                                                                       SUBROUTINE GRAF(1L)
CALL PLTLU(12)
CALL LLEFT
                                                                                                                                                                                                                                                                                                                                     CALL PLOTCXX,YY,2>
RETURN
                                                                                                                                                                                                                                                                                     CALL PLOTCXX, YY, 3>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DINERSION TOMBELLY
                                                                                                                                                                                                                                                                                                                                                                                                                                    SUBROUTINE NGRAF
CALL URITE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUBROUTINE CLEAR
                                                                                                                                                                                                                                                                                                 DO 7 I=2,HXY
XX = X(1),51,2
YY = Y(1)/51.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CALL DELAY(0.1)
                                                                                                                                                            SIZE = 10.764.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                URITE (LU, 200)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         200 FORMAT ("EE")
                                                                                                                                                                                                 RETURN
                                                                                                                                                                                                                                                                                                                                                                                                              RETURN
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HULT - POSITIVE INTEGER INDICATING THE NUMBER OF CHITS
THE CALLING PROGRAM SHOULD BE PUT IN A WAIT STATE
IRES - THE RESOLUTION OF MULT, I.E.
0 - 10'S OF MILLISECONDS
1 - MILLISECONDS
2 - SECONDS
                                                                                                                                                                                                                                                                                                                                                                   THIS ROUTINE DUFLICATES THE FUNCTION OF THE WAIT SUBROUTINE FOUND IN THE ISA LIBRARY. THE INPUT VARIABLES ARE DEFINED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBROUTINE INCITYPE, JIYPE, X, Y, IXY, ICKAR, HOWA, IXL, IXH, IYL, IYH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FCHULT.GT.0 .AND. IRES.GE.0 .AND. IRES.LE.33G0 10 4
                                                                                                                                                                                                        URITE (LU, 200) IX, IY, (CHOUT(I), I=1, NUORDS)
                                                                                                                                                                                                                                (LU, 201) 1X, 1Y, (CHGUT(1), 1-1, NWORDS)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3 - ILLEGAL PARANETER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1 - REQUEST ACCEPTED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         - RETURNED ERROR FLAG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3 - HINUTES
                                                                                                                                                                                                                                                                                                                                            SUBROUTINE WAIT (MULT, IRES, IERR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMMON IDURCEAD, LU, IDUNIE 7325
                                                                                                          HUORDS = < HCHAR = 13/2 + 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IF( IRES . EO. | ) IN = 1H/10
                                                          - 31 - IHT(0, 6625 * Y)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IF ( IRE 9 . EQ. 0) IR = 1
CALL EXEC( 12, 0, IR, 0, -IH)
                                                                                                                                                                                         IFCHOPE .EQ. 3760 TO 25
                                                                                                                     IFCHODE . NE. 1 )GO TO 15
                                                                                                                                                                                                                                                                              SUBROUTINE DELAY(SEC)
IF(1XY .GE. 0)G0 TO 2
                                                                        IFCIY .LE. 223G0 TO 7
                                               # INT(0.125 + X)
                                                                                                                                                                                CHOUTCED - ICHARCED
                                                                                                                                                                                                                                                                                            MSEC = 1000.0 + SEC
                                                                                                                                            CHOUT(1) - BLANKS
                                                                                                                                                                                                                                                                                                         CALL WAITCHSEC, 1)
           IX = INT(X)
IY = 31 - INT(Y)
G0 T0 4
                                                                                                                               00 12 I=1, HUGRDS
                                                                                                                                                                     DU 16 I=1, HAUGRDS
                                                                                                                                                                                                                                             CALL DELAY(0.1)
                                                                                                                                                                                                                                                                                                                                                                                            AS FOLLOWS!
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            160 FORMAT (3202)
                                                                                   1Y = 1Y - 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        101 FORMAT (12)
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                                                                                              GO 10 4
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INTEGER UFG, UP9, UP BL
DIMENSION ICHARK (1)
DATA UFD/030000B/, UP9/034400B/, UFBL/02000BB/,
LOWO/600660B/, LOW9/000071B/, LOUGL/660040B/
                                                                                                                                                                                                                                                 9 IFCIXUP.GE.UPO .AND. IXUP.LE.UP9 .AND.
IXLOW.GE.LOWO .AND. IXLOW.LE.LOW9 XGO TO 12
IFCITYPE .EG. 2)RETURN
                                                                                                                                                                                                                                                                                                                                 READ (IXIN,101) IX
IF(IX,GE,IXL, AND, IX,LE,IXH)GD TO 15
IF(ITYPE,ED, 2)RETURN
                                                                           HWORDS = (NCHAR - 1)/2 + 1
READ (LU, 100 > (1CHAR(1), i=1, NWORDS)
IF(ITYPE , EG. 0)RETURN
IXIN = ICHAR(1)
GO TO 7
                                                                                                                                                  4 REAG (LU, 160> IXIH
7 IXUP = JAND IXIH, 177405B)
1F( IXUP - EG. UFBL)IXUP = UPB
                                                                                                                                                                                            |XLOW = |AHDC||XIH, 606377B)
|FC||XLOW | HE. LOWEL||SO TO 9
|XLOW = |SHIFC||XUP, 8)
                                                                   IFCITYPE .EG. 1360 TO 4
                                                                                                                                                                                                                                                                                                           1XIN = 10R(1XUP, 1XLOU)
                                                                                                                                                                                                                                                                                                                                                                                                                                    SUBROUTINE VERSK IVER)
                                                                                                                                                                                                                                       IXUF - UPG
                                                                                                                                                                                                                                                                                                                     CALL CODE
                                                      JIYPE = 0
                                                                                                                                                                                                                                                                                                                                                                                             JTYPE . 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                  1VER - 1
                                                                                                                                                                                                                                                                                              GO TO 4
                                                                                                                                                                                                                                                                                                                                                                               GO TO 4
                                                                                                                                                                                                                                                                                                                                                                                                        RETURN
                                                                                                                                                                                                                                                                                                                                                                                                                                                               RETURN
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4-128

# ICALIX T=00003 IS ON CROBO37 USING DEDI3 BLKS R=0006

ASHB, R, F, L

1005

0005

\*CAB, 81 6811 ENTRY GETSC RETURNS THE X AND Y SCALE FACTORS TO THE USER AND SET THE X AND Y SCALE FACTORE BOTH TO 1 ENTRY SETSC SETS THE X AIRD Y SCALE FACTORS FOR CONVEXSION ENTRY CALIX CONVERTS AN X COORDINATE IN USER'S UNITS (IN A & B REGISTERS) TO AN X COURDINATE IN RASTER UNITS ENTRY CALLY CONVERTS A Y COORDINATE IN USER'S UNITS CIN A & B REGISTERS) TO A Y COORDINATE IN RASTER UNITS CIN A REGISTER) FOR THE PLASHASCOPE 9 ENTRY SETOR SETS THE X AND , ORIGIN FOR CONVERSION USER'S UNITS TO RASTER UNITS ENTRY GETOR RETURNS THE X AND Y ORIGIN TO THE USER AND 9ET9 THE X AND Y ORIGIN BOTH TO 0 EUTRY LASTM IS THE STORNGE LOCATION CONTAINING THE LAST MODE WORD OUTPUT ניאנוא, ל REEDS GRAPHICS Calix, Caliy, Setor, Betsc, Getor, Getsc, Lastm .entr **0** 6.5 GET HOTPENSES OF KURG, YORG - YORG) \* YSCAL + RETURN TO CALLING PROGRAM RETURN TO CALLING PROGRAM - XORG > + XSCAL (IN A REGISTER) FOR THE PLASMASCOPE OF USER'S UNITS TO RASTER UNITS ENTRY EXIT LINE ENTRY/EXIT LINE ENTRY/EXIT LINE **}** \* R × 7 HAM CALIX,7 CAL 1X, 1 CALIY, I COO LENTR KSCAL YSCAL XOPG YORG PTS PTS **BSS 1** FSB XE FSB FAB EHT EXI 888 d E E FF FRD FF CALIY NOP XIL 100 AC 25 CALIX XTMP YTHP 1000 8000 6000 0022 0028 0029 0031 6033 0038 0043 0045 0048 2000 0003 9000 2060 0012 0013 100 2100 900 2100 9199 6100 0020 0021 0024 0025 0026 0032 0034 9035 9600 2600 6600 0653 0055 0056 0000 0027 0057 0058 1100 4-129 ( C **C**.

DLD XTMP, I STORE XORG DST XORG	DLD YTMP, I STORE YORG DST YORG	JNF SETOR, I RETURN TO CALLING PROGRAM	HOP EMTRY/EXIT LIME JSB .EHTR GET ADDRESSES OF XSCAL, YSCAL		DST YSCAL JMP SETSC, 1 RETURH TO CALLING РКОСКНИ	HOP ENTRY/EXIT LINE JSB .EHTR GET ADDRESSES OF XORG, YORG DEF XTMP	DLD XORG RETUKN XORG AND REPLACE WITH O DST XTHP, I DLD FLTO DST XORG	DLD YORG RETURN YORG AND REPLACE WITH B DST YTMP, I DLD FLTO DST YORG	JMP GETOR, I RETURN TO CALLING PROGRAM HOP ENTPY EXIT LINE	, ENTR GET ADDRESS XTHP	DLD XSCAL RETUKH XSCAL AND REFLACE WITH I DST XTMP, I DLD FLTI DST XSCAL	nio yscol — pernifil ystol allo befilate nith i Yth
	33	<u> </u>	ET3C			ETOR			ETSC 1		2252	Ξ.
6666 6666 6666 6666 6666	* * * * * * * * * * * * * * * * * * *		000 0072 0002 0073 0073	6075 6075 6075 6076 6076		_	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	•	000	3 % 0 ==		22

4-130

			RETURN TO CALLING PROGRAM					LAST NOVE WORD OUTPUT																		
rlti	YSCAL		GETSC, I										e. 0	• •	•:		-	•		•	•:					END CALIX
Ē	<b>DST</b>		¥					₹ 2					SEC	DEC	DEC		DEC	DEC		DEC	DEC					E S
		*		•	<del>*</del>	•	•	LASTH	•	•	•	•	P15	FLTG	FLI		XOKG	YORG	•	XSCAL	YSCAL	•	•	•	•	
6119	0120	1210	9 i 22	0123	2124	0125	9156	0127	9158	6129	96196	0131	0132	6133	0134	0135	0136	9137	0138	6113	0 7 0	-7-10	0142	6143	** :	145

# OF FOOR QUALITY

THIS ROUTHE PLOTS DASHED LINES ON THE PLASMASCOPE	Č O O	M ASMB, R, F, L	R, F, 1			
HAM DELINE, TREEDS GRAPHICS ENT ENTR.GETOR.GETSC.SGRT.LINE.SETOR.SETSC  KHAN DELINE EXT. ENTR.GETOR.GETSC.SGRT.LINE.SETOR.SETSC  KHAN BSS I  HAY BSS I  HAY BSS I  HAY BSS I  HAY BSS I  LDA HAY, I  SE ENTR GET ADDRESSES OF X,Y,HKY,ETC.  LDA HAY, I  SE ETOR  CHA, INA  SSA, RSS  LOF HAY  LOS ENTR GET ADDRESSES OF X,Y,HKY,ETC.  LDA HAY, I  SSA, RSS  SSA, RSS  SSA, RSS  SSA, RSS  SSA, RSS  SSA, RSCAL  CHA, INA  SSA, RSCAL  CET CREGIN VALUES AND SET THE ORIGIN  DEF **3  VALUES EGNAL TO 6 FOR CALLS TO THE  DEF **3  VALUES EGNAL TO 1 FOR CALLS TO THE  DEF YSCAL  CLA  CLA  CLA  CLA  CLA  CLA  CLA	300	* *	7101			
HAM DELINE, 7  ENT - ENTR, GETOR, GETSC, SORT, LINE, SETOR, SETSC  ENT - ENTR, GETOR, GETSC, SORT, LINE, SETOR, SETSC  ENT - ENTR, GETOR, GETSC, SORT, LINE, SETOR, SETSC  ENTR, GETOR, GETSC, SORT, LINE, SETOR, SETSC  ENTRY, GES 1  HAVE BSS 1  HAVE BSS 1  HAVE BSS 1  LEFC AND HELD IN CALLING PROCRAM  STA HUM HO SET POINT COUNTER  LEFC BST BSS 1  HAVE SEQUEL TO FOR CALLY AND CALLY  LEFT STALL BST BSS 1  LEFT STORE BASH LEHGTH AND SET THE SCALE  DEF XSCAL  LEFT STORE BASH LEHGTH AND SPACE  STA LEHIS LEFT BST BST THE MODE  STA HORE BST						
HAM DLINE, 7  KETOS GRAPHICS  ENT ENTR, GETOR, GETSC, SORT, LINE, SETOR, BETSC  WAY BAS I  HAY BAS I  LDA HAY, I  SA LEHR  SA LEHR  SA LEHR  SA LEHR  SA LEHR  CHA, INA  SA LEHR  SA CET SCALE VALUES AND SET THE ORIGIN  DEF ***3  VALUES EUUHL TO CALLING PROCRAM  SA LENG  CHA, INA  SA CET SCALE  DEF ***3  VALUES EUUHL TO CALLING PROCRAM  WALUES EUUHL TO GALIX AND CALIY  DEF YORG  CHA LINE ROUTINES CALIX AND CALIY  DEF YORG  CHA LERCH LENGTH HALEN SPACE  STA LENS  CLA  CLA  CLA  CLA  CLA  CLA  CLA  CL	9 9		SPA	n ine Len CES VARIA	5	•
HAM DELINE;  KHT GETOR, GETSC, SORT, LINE, SETOR, SETSC  X BSS 1  HXY BSS 1  HXY BSS 1  HXY BSS 1  LDASH BSS 1  LDASH BSS 1  LDASH BSS 1  LDA HXY, I IS HXY < 2 ?  ADA HEGI  CHA, INA  SSA, RSS  JHP DELINE, I IS HXY < 2 ?  ADA HEGI  CHA, INA  SSA, RSS  LDA HXY, I IS HXY < 2 ?  ADA HEGI  CHA, INA  SSA, RSS  LDA HXY, I IS HXY < 2 ?  ADA HEGI  CHA, INA  SSA, RSS  LDA HXY, I IS HXY < 2 ?  ADA HEGI  CHA, INA  SSA, RSS  LDA HXM  SSA, RSS  LDA HXM  SSA, RSS  LDA HXM  SSA, RSS  LDA LSSCAL  CET COLLER VALUES AND SET THE ORIGIN  DEF XSCAL  EXTERNAL ROUTINES CALLS TO THE  DEF XSCAL  EXTERNAL ROUTINES CALLS TO THE  DEF XSCAL  EXTERNAL ROUTINES CALLS TO THE  DEF XSCAL  CLA LORSH  STA LENS  LDA HADE, I STORE DASH LENGTH AND THE  STA LENS  LDA HODE, I STORE THE MODE  STA DORS  LDA HODE, I STORE THE MODE  STA DORS  LDA HODE, I STORE THE MODE  STA DORS  LDA HODE, I THE LINE FOUNT IN THE FIRST POINT IN THE LINE AND STORE THE FIRST POINT TO THE PARKEN AND STORE THE FIRST POINT TO THE PARK	000					
EXT : ENTR, GETOR, GETSC, SGRT, LINE, SETOR, SETSC  WAY BSS 1  HOUSE BSS 1  LDA SS 1  LDA HXY BSS 1  LDA HXY I IS HXY < 2 ?  ADA HELI  STA HUM SSA RETURN TO CALLING PROGREST OF X, Y, HXY, ETC.  LDA LDA HXY I IS HXY < 2 ?  ADA HELI  STA HUM SSA RETURN TO CALLING PROGREST OF X, Y, HXY, ETC.  LDA LDA HELI  STA HUM SSA RETURN TO CALLING PROGREST OF X, Y, HXY, ETC.  LDA LDA LDA SET POINT COUNTER  STA LENS  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA HODE, I STORE THE MODE  STA HODE  STA HODE  STA HODE  STA LENS  LDA HODE, I STORE THE FIRST POINT ON  LDA HODE, I STORE THE FIRST POINT ON  LDA HODE, I STORE THE FIRST POINT ON  LDA X, I HELIA STORE THE PROPE  STA ALIA STORE THE FIRST POINT ON  LOS CALLS   90	<u>~</u> #				*CAB,816	
HKY BSS I  WAY BSS I  HAY BSS I  LDASH BSS I  LDASH BSS I  LLASH BSS I  LLASH BSS I  LLASH BSS I  LDA HKY, I  SSA RBS  S	9	2			TOR, GETSC, SGRT, LINE, SETOR, SETSC	
HXY BSS 1 HXY BSS 1 LDASH BSS 1 LDASH BSS 1 LDA BSS 1 LDA HXY SX 1 LDA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HXY I IS HXY < 2 ? ADA HELI CHA HAM SSA RS STA HUM SSA RS STA HUM SSA RS STA HUM SSA RS STA HUM SSA RS STA LENS LENGTH HAB SET THE 9 DEF XSCAL STA LENS LENGTH IN LENS AND SET THE 9 DEF XSCAL CLA CLA CLA CLA CLA CLA CLA CLA CLA	3	•				
HOVE BSS 1 HOVE BSS 1 LDASH BSS 1 LLDASH BSS 1 LLDASH BSS 1 LLDASH BSS 1 LLDA HXY, 1 S HXY, 1 S HXY, 1 S HXY, 2 S GET ADDRESSES OF X,Y,HXY,ETC. LDA HXY, 1 S HXY < 2 7 ADA HEGI CHA, 1HA SSA,RBS JNP DLIHE, 1 STA HUN SSA,RBS JNP DLIHE, 1 STA LENGTH HUES AND SET THE SET YOUR EXTERNAL ROUTINES CALLS AND CET SCALE DEF XSCAL STA LENS LDA LDASH, 1 STORE DASH LENGTH AND SPACE STA LOLEN STA LOLEN STA LOLEN STA LOLEN STA LOLEN STA LOLEN STA HODE STA HUTS, 152 X AND STORE THE FIRST POINT ON THE LINE AS POINT 1 STORE X, 1 THE LINE AS POINT 1 STORE X, 1 THE LINE AS POINT 1	00		888	-		
HAY BSS 1  LDASH BSS 1  LSFC BSS 1  LSFC BSS 1  JSB .EHTR GET ADDRESSES OF X,Y,HXY,ETC.  LDA HXY, 1 IS HXY < 2 ?  ADDA HEC!  CHA 1HA  SSA,RSS  JMP DLINE, 1  JSB GETOR  GET ORIGIN VALUES AND SET THE  DEF XORG  EXTERNAL TO 0 FOR CALLS TO  DEF XSCAL  LDA LDASH, 1  STA LEHS  LDA LEHS  LDA LOEN  STA LOLEH  STORE THE MODE  LDA MODE, 1  STORE THE MODE  LDA MODE  LDA MODE  STA LOLEH  STORE THE MODE  STA LOLEH  STA LOLEH  STORE THE MODE  STA LOLEH  STORE THE MODE  STA LOLEH  STA LOLEH  STORE THE MODE  STORE THE FIRST POINT ON  LDA MODE  STORE THE FIRST POINT ON  LDA K, 1  THE LINE AS POINT I	90		BSB	-		
LDASH BSS 1  LSFC BSS 1  LSFC BSS 1  LSFC BSS 1  SERVINE HOP  JSB .EHTR GET ADDRESSES OF X,Y,MXY,ETC.  LDA MXY,1 IS MXY < 2 ?  ADA NEG1  CHA,1NA  SSA,RBS  JNP DLINE,1 YES RETURN TO CALLING PROGRA  JSB GETOR GET SCALES THE DEF X-3 VALUES EQUAL TO 0 FOR CALLS TO DEF XORG  EXTERNAL ROUTINES CALIX AND COFF XORG  JSB GETSC GET SCALE VALUES AND SET THE DEF XSCAL  LDA LDASH,1 STORE DASH LENGTH AND SPACE  STA LEHS  LDA LDASH,1 STORE DASH LENGTH AND THE GASTA LENGTH AND THE GASH DORS  LDA MODE,1 STORE THE MODE  LDA MODE,1 STORE THE MODE  LDA MODE,1 STORE THE FIRST POINT ON THE LINE AS FOINT 1  LSZ X  JSB CALIX  AND STORE THE FIRST POINT ON THE LINE AS FOINT 1  STA MODE  LDA X,1 THE LINE AS FOINT 1	90		888	-		
LDASH BSS 1  LSFC BSS 1  BLINE HOP  SENTRY/EXIT LINE  JSB .EHTR GET ADDRESSES OF X,Y,HXY,ETC.  LDA NEG.  CHA, 1HA  SSA,RSS  JMP DLINE, I IS NXY < 2 7  ADA NEG.  CHA, 1HA  SSA,RSS  JMP DLINE, I YES RETURN TO CALLING PROGRA  SSA,RSS  JMP DLINE, I YES RETURN TO CALLING PROGRA  SSA,RSS  JMP DLINE, I YES RETURN TO CALLING PROGRA  SSA,RSS  JMP DLINE, I YES RETURN TO CALLING PROGRA  SSA,RSS  JMP DLINE, I STARE HOUTINES CALLX AND COFF XSCAL  DEF XSCAL  CET SCALE VALUES EQUAL TO 1 FOR CALLS TO FER YSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA LDASH, I STORE DASH LENGTH AND THE OASH DORS  LDA MODE, I STORE THE MODE  STA LOLEN  STA DORS  LDA MODE, I STORE THE MODE  STA MODED  LDA MODE, I STORE THE FIRST POINT ON THE LINE AS POINT I  SSA, XSA  JSB CALLX  JSB CALLX  LLO KA, 1 THE LINE AS POINT I  SSA, XSA  JSB CALLX  JSB CALLX  JSB CALLX  JSB CALLX  THE LINE AS POINT I	00		888	_		
LSFC BSS 1  LSFC BSS 1  SELINE HOP  LINE HOP  LDA HXY, 1  SSA, R8S  LDA HXZ, 1  SSA, R8S  JMP DLINE, 1  SSA, R8S  SSA, R8S  JMP DLINE, 1  SSA, R8S  SSA, R8S  SSA, R8S  JMP DLINE, 1  SSA, R8S  SSA, RETURN TO CALLING PROFF  STORE THE MODE  STORE THE MODE  STORE THE MODE  STORE THE RSS POINT ON THE  SSA, RAID STORE THE FIRST POINT ON THE  SSA, RAID STORE THE FIRST POINT ON THE  SSA, RAID STORE THE FIRST POINT ON THE  SSA, REMAN  SS	9			-		
LDA HXY, I IS HXY < 2 ?  CHA, INA SSA, GRS JMP DLINE, I IS HXY < 2 ?  CHA, INA SSA, GRS JMP DLINE, I IS HXY < 2 ?  CHA, INA SSA, GRS JMP DLINE, I IS HXY < 2 ?  CHA, INA SSA, GRS JMP DLINE, I IS HXY < 2 ?  CHA, INA SSA, GRS JMP DLINE, I IS HXY < 2 ?  CHA, INA SSA, GRS JMP DLINE, I IS HXY < 2 ?  STA HUN  JSB GETOR  GET ORIGIN VALUES AND SET THE VALUES EQUAL TO 0 FOR CALLS TO  DEF YORG  LDA CALLS TORG  EXTERNAL ROUTINES CALIX AND CEF YORG  STA LENS LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LSPC, I STA LENS LDA LORE STA LOLE  CLA  CLA  CLA  CLA  CLA  CLA  CLA  C	3		BSS	-		
LDA HXY, I IS HXY < 2 ?  LDA HXY, I IS HXY < 2 ?  ADA HEG! CHA, INA SSA, RSS JMP DLINE, I YES RETURN TO CALLING PROGR STA HUM JSB GETOR GET ORIGIN VALUES AND SET THE DEF XORG EXTERNAL ROUTINES CALLS AND DEF XORG LS CALS DEF XORG LS CALS DEF XORG LS CALLS DEF XORG LENS LLAR LENS LENS LENS LENS LENS LENS LENS LENS	00					
LDA HXY, I IS HXY < 2 7  ADA HXY, I IS HXY < 2 7  ADA HWE I CHA INA SSA, RBS JMP DLINE, I YES RETURN TO CALLING PROGR STA HUM JSB GETOR  GET ORIGIN VALUES AND SET THE JSB GETOR  GET SCALE VALUES AND SET THE JSB GETSC  JSB GETSC  GET SCALE VALUES AND SET THE DEF XORG  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LUM STA LENS+I STA LOLEN STA LOLEN STA LOLEN STA HODE, I STORE THE MODE  LDA HODE, I STORE THE MODE  LDA MODED  LDA K, I GET, CONVERT TO RASTER UNITS, LDA K, I THE LINE AS POINT I  LSS X  AND STORE THE FIRST POINT ON  LOGE X, I  LSS CALLX  LSS	3				ENTRY/EXIT LINE	
LDA HXY, I IS HXY < 2 ?  LDA HXY, I IS HXY < 2 ?  ADA HEG!  ADA HEG!  CHA, INA  SSA, RBS  JMP DLINE, I S HXY < 2 ?  ADA BET POINT COUNTER  JSB GETOR  GET ORIGIN VALUES AND SET THE  DEF XORG  EXTERNAL TO 0 FOR CALLS TO  DEF XORG  GET SCALE VALUES AND SET THE 9  DEF XORG  GET SCALE VALUES AND SET THE 9  DEF XORG  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA LORS  LDA LORS  LDA LORS  LDA LORS  LDA LORS  LDA HODE, I STORE THE MODE  STA LOLEH  STA HOUR  STA LOLEH  STA HOUR  STA HOUR  STA LOLEH  STA HOUR  STA LOLEH  STA HOUR  STA LOLEH  STA RORS  LDA MODED  THE LINE AS POINT I  152 X  AND  LIE LINE AS POINT I  THE LINE AS POINT II	3		!			
LDA NXY, I IS NXY < 2 ?  ADA NEGI CHA, INA SSA,RSS JMP DLINE, I YES RETURN TO CALLING PROGR STA NUM JSB GETOR GET ORIGIN VALUES AND SET THE DEF **3  PET YORG GET SCALE VALUES AND SET THE DEF XSCAL SSB GETSC GET SCALE VALUES AND SET THE 9 DEF XSCAL LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LDASH, I STORE LETTOVEK LENGTH AND THE STA LOLEH STA HODED  LDA MODE, I STORE THE MODE STA MODED  LDA X, I AND STORE THE FIRST POINT ON LOS X, I THE LINE AS POINT I STS X AND STORE THE AS POINT I	700	<b>o</b> •	150		ADDRESSES OF	
LDA HXY, I IS HXY < 2 ?  ADA HEG! CHA, INA  SSA,R8S JHP DLINE, I YES RETURN TO CALLING PROGR STA NUM  JSB GETOR GET ORIGIN VALUES AND SET THE DEF XORG  LDF YORG  STA LENS  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS  LDA HODE, I STORE THE MODE STA LOLEN  CLA  CLA  CLA  CLA  CLA  CLA  CLA  CL	3 6		Ţ			
ADM NAT. I IS NAY C. 2.7  ADM NEG! CHA, IMB SSA, RBS JMP DLINE, I VES RETURN TO CALLING PROGR STA NUM DLINE, I VES RETURN TO CALLING PROGR STA NUM DEF XOR  LDA CETOR GET ORIGIN VALUES AND SET THE DEF XOR  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LOEN STA LENS LDA MODE, I STORE THE MODE STA HODE  LDA MODE, I STORE THE MODE STA HODE STA HODE STA HODE STA HODE STA LOLEN STA HODE STA HODE STA LOLEN STORE THE MODE STA HODE STORE THE MODE STA HODE	700				,	
CLA LOASH AND SET POINT COUNTER  JSB GETOR  GET ORIGIN VALUES AND SET THE DEF X-13  VALUES EGUAL TO 0 FOR CALLS TO FOR CAL	3 (	<b>.</b>	H 0		HXY C 2	
SSA, RBS JMP DLINE, I YES RETURN TO CALLING PROGR STA NUM JSB GETOR GET ORIGIN VALUES AND SET THE DEF X-3 VALUES EGUAL TO 0 FOR CALLS TO FE YORG  LDE YORG  LDE YORG  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS  LDA LDASH, I STORE THE MODE  STA LENS  LDA LDASH, I STORE THE MODE  STA LENS  LDA MODE, I STORE THE MODE  STA HODE  LDA X, I AHD STORE THE FIRST POINT ON LOB X, I THE LINE AS FOINT I	000	•	ADA			
SSA, RBS  JAP DLINE, I YES RETURN TO CALLING PROGR STA NUM  JSB GETOR  GET ORIGIN VALUES AND SET THE  UFF **3  VALUES EQUAL TO 0 FOR CALLS I  DEF XORG  EXTERNAL ROUTINES CALIX AND  DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA LOEN  STA LENS  LDA MODE, I STORE THE MODE  STA HODE  LDA NOED  LDA X, I GET, CONVERT TO RASTER UNITS,  AND STORE THE FIRST POINT ON  LOB X, I THE LINE AS POINT I	000	32	CHA	, INA		
JUP DLINE, I YES RETURN TO CALLING PROGRESSTA NUM  JSB GETOR  GET ORIGIN VALUES AND SET THE  DEF XORG  JSB GETSC  GET SCALE VALUES AND SET THE S  DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE  STA LENS  LDA LSPC, I  STA LENS  LDA NODE, I  STORE THE MODE  LDA X, I  LDA X, I  GET, CONVERT TO RASTER UNITS, AND  LDA X, I  GET, CONVERT TO RASTER UNITS, AND  LOB X, I  LDA X, I  LENGTH IN LENS ARRAY  LDA X, I  GET, CONVERT TO RASTER UNITS, AND  LOB X, I  LOB X	9	92	8SA	, ƙ85		
JSB GETOR GET ORIGIN VALUES AND SET THE DEF **3 VALUES EGUAL TO 0 FOR CALLS TO FE TORGEN VALUES AND SET THE DEF YORG  JSB GETSC GET SCALE VALUES AND SET THE SOFE **3 VALUES EGUAL TO 1 FOR CALLS TO F SCALL STORE DASH LENGTH AND SPACE STALENS. IS TO BE STORE THE MODE  LDA LDASH, I STORE DASH LENGTH AND SPACE STALENS. I STORE THE MODE  STALENS. I STORE THE MODE  LDA K, I GET, CONVERT TO RASTER UNITS, AND STORE THE FIRST POINT ON THE LINE AS POINT I  152 X  JSB GALIX  JSB	00	2.	SH.		RETURN TO CALLING	
JSB GETOR GET ORIGIN VALUES AND SET THE DEF XORG  LEF YORG  JSB GETSC  GET SCALE VALUES AND SET THE 9  JSB GETSC  GET SCALE VALUES AND SET THE 9  DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS  LDA LSPC, I STORE DASH LENGTH AND SPACE STA LENS  LDA LSPC, I STORE DASH LENGTH AND SPACE STA LENS  LDA LSPC, I STORE THE MODE  STA LOLEN  STA LOLEN  STA DORS  LDA X, I GET, CONVERT TO RASTER UNITS, AND STORE THE FIRST POINT ON THE LINE AS POINT I STORE THE MASS FOUNT STARL STARL STARL STARL STORE THE FIRST POINT ON THE LINE AS POINT I	700		STA		SET	
JSB GETOK  LDA LDASH, ISTORE DASH LENGTH AND SPACE  STA LENS+1  STA LENS+1  CLA  LDA HODE, ISTORE THE MODE  STA HODED  LDA MODE, ISTORE THE MODE  STA HODED  LDA K, I GET, CONVERT TO RASTER UNITS, AND STORE THE FIRST POINT ON THE LIST X  LOA X, I GET, CONVERT TO RASTER UNITS, AND STORE THE FIRST POINT ON THE LIST X  LOA X, I GET, CONVERT TO RASTER UNITS, AND STORE THE FIRST POINT ON THE LIST X  LSZ X	00		9			
DEF YORG  SEE YO	) ( ) (	2 :	E C		UKIGIN VALUES AND SET THE	
JSB GETSC GET SCALE VALUES AND SET THE DEF **3  DEF XSCAL  DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS  LDA LSPC, I STA LENS+1  CLA  CLA  CLA  CLA  CLA  STA LOLEN  STARE THE MODE  LDA X, I AND STORE THE FIRST POINT OR  LOLE X, I AND STORE THE FIR	9 6	= 2	7 17			
JSB GETSC GET SCALE VALUES AND SET THE DEF **3 VALUES EQUAL TO 1 FOR CALLS DEF XSCAL  LDA LDASH, 1 STORE DASH LENGTH AND SPACE STA LENS LDA LSPC, 1 STA LENS LDA LSPC, 1 STA LENS LDA LSPC, 1 STA LOLEN STA LOLEN STA DORS LDA MODE, 1 STORE THE MODE STA MODE  LDA MODE, 1 GET, CONVERT TO RASTER UNITS, 152 X JSB CALIX JSB CALIX  *** JSB CALIX *** JSB CALIX JSB CALIX  *** JSB CALIX JSB CALIX JSB CALIX JSB CALIX JSB CALIX  *** JSB CALIX JSB		4 L	ניני		CMLIA MID.	
JSB GETSC  GET SCALE VALUES AND SET THE DEF XSCAL  DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LSPC, I STA LENS LDA MODE, I STORE THE MODE  LDA MODE, I STORE THE MODE  LDA X, I AND STORE THE FIRST POINT ON LOS X, I AND STORE THE FIRST POINT ON LOS X, I AND STORE THE AS POINT I ISZ X USB CALIX  SSB CALIX  AND STORE THE AS POINT I ISZ X USB CALIX	700					
DEF XSCAL  DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LSPC, I STA LENS LDA MODE, I STORE THE MODE  LDA MODE, I STORE THE MODE  LDA MODE  STORE THE MODE  THE LINE AS POINT I  ISZ X  USB CALIX  SXX	003		HSI.		SCALE VALUES AND SET THE	
DEF XSCAL  LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LSPC, I STA LEIS+!  CLA STA LOLEH STA LOLEH STA DORS  LDA X, I GET, CONVERT TO RASTER UNITS, ISZ X  LSB CALIX  XX  AND STORE THE FIRST POINT OF STORE THE LINE AS POINT I  STORE THE AS POINT I  STORE THE MODE  AND STORE THE FIRST POINT OF STORE THE LINE AS POINT I  STORE THE LINE AS POINT II  STORE	F 0 0	9	000		HES EQUAL TO 1 FOR CALLS	
LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LDA LSPC, I STA LENS+I STA LENS+I STA LOLEH STA LOLEH STA DORS LDA MODE, I STORE THE MODE STA MODED LDA X, I GET, CONVERT TO RASTER UNITS, AND STORE THE FIRST POINT ON LOSS CALIX SSB CALIX XX	003		DEF			
LDA LDASH, I STOKE DASH LENGTH AND SPACE STA LENS  LDA LSPC, I STA LENSTH IN LENS ARRAY  CLA STA LOLEN  STA LOLEN  STA DORS  LDA MODE, I STORE THE MODE  STA MODED  LDA X, I GET, CONVERT TO RASTER UNI  ISZ X AND STORE THE FIRST POINT  LOB X, I THE LINE AS POINT I  ISZ X  JSB CALIX  XX	00	9	DEF			
LDA LDASH, I STORE DASH LENGTH AND SPACE STA LENS LENGTH IN LENS ARRAY LDA LSPC, I STA LENSH I CLEAR LEFTOVER LENGTH AND STA DORS  LDA MODE, I STORE THE MODE STA MODED  STA MODED  LDA X, I GET, CONVERT TO RASTER UNI ISZ X AND STORE THE FIRST POINT LDB X, I THE LINE AS POINT I ISZ X AND STORE THE FIRST POINT ISZ X AND	00				•	
STA LENS  LDA LSPC, I STA LENS+!  CLA  CLA  STA LOLEH  STA DORS  LDA MODE, I STORE THE MODE  STA MODED  LDA X, I CET, CONVERT TO RASTER UNI ISZ X  JSB CALIX  XX	000	9	LDA			
LDA LSPC, I STA LENS+1  CLA STA LOLEN STA LOLEN STA DORS  LDA MODE, I STORE THE MODE  STA MODED  LDA X, I GET, CONVERT TO RASTER UNI ISZ X  JSB CALIX  XX	00	=	STA			
CLA CLAR LEFTOVEK LENCTH AND STA LOLEN DASH OR SPACE INDICATOR STA DORS  LDA MODE, I STORE THE MODE STA MODED  STA MODED  LDA X, I GET, CONVERT TO RASTER UNI ISZ X AND STORE THE FIRST POINT PO	00	2	LDA	_		
CLA CLEAR LEFTOVEK LENGTH AND STA LOLEH DASH OK SPACE 'INDICATOR STA DORS  LDA MODE, I STORE THE MODE STA MODED  LDA X, I GET, CONVERT TO RASTER UNI ISZ X AND STORE THE FIRST POINT IN STANDARD THE FIRST POINT IN STANDARD THE LINE AS POINT IN STANDARD THE FIRST POINT	90	<u>m</u>	STA			
CLA CLEAR LEFTOVEK LENGTH AND STA LOLEH DASH OK SPACE 'INDICATOR STA DORS  LDA MODE, I STORE THE MODE STA MODED  LDA X, I GET, CONVERT TO RASTER UNI 1SZ X AND STORE THE FIRST POINT LOB X, I THE LINE AS POINT I 15Z X USB CALIX XX	00					
STA LOLEN DASH OR SPACE INDICATOR STA DORS  LDA MODE, I STORE THE MODE STA MODED  LDA X, I GET, CONVERT TO RASTER UNIT 1SZ X AND STORE THE FIRST POINT LOB X, I THE LINE AS POINT I 15Z X USB CALIX XX	703	ī.	CLA		LEFTOVER LENGTH AND	,
LDA MODE, I STORE THE MODE  STA MODED  LDA X, I GET, CONVERT TO RASTER UNIT  152 X AUD STORE THE FIRST POINT  LDB X, I THE LINE AS POINT I  152 X  USB CALIX  XX	00	9	STA		OR SPACE	
LDA HODE, I STORE THE MODE  STA MODED  LDA X, I GET, CONVERT TO RASTER UNIT  ISZ X AND STORE THE FIRST POINT  LOB X, I THE LINE AS POINT I  ISZ X  USB CALIX  XX	0	~	STA			
LDA MODE, I STORE THE MODE  STA MODED  LDA X, I GET, CONVERT TO RASTER UNIT  ISZ X AND STORE THE FIRST POINT  LOB X, I THE LINE AS POINT I  ISZ X  USB CALIX  XX	0.0					
LDA X, I GET, CONVERT TO RASTER UNITISZ X AND STORE THE FIRST POINT LOB X, I THE LINE AS POINT I ISZ X USB CALIX	700	<u> </u>	LDA			
LDA X, I GET, CONVERT TO RASTER UNITIES X AND STORE THE FIRST POINT LOB X, I THE LINE AS POINT I ISZ X USB CALIX	000		9TA			
LDA X, I GET, CUNVERT TO RASIER UNI 1SZ X AND STORE THE FIRST POINT LDB X, I THE LINE AS POINT I 1SZ X USB CALIX XX	00	_			1	
ISZ X AND STORE THE FIRST POINT LOB X, I THE LINE AS POINT I ISZ X USB CALIX XX	665	Ŋ	LCA		CONVERT TO RASTER UNIT	
LOB X, 1 THE LINE 152 X USB CALIX XX	00	m	182		STORE THE FIRST POINT	
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<u> </u>		ALEN ALEN FLOAT AND STORE IN TEMP TEMP ALEN ALEN TOLEN THE LAST TIME AND STORE IN LOLEN LOLEN THE LAST TIME AND STORE IN LOLEN THE LAST TIME AND STORE THE LAST TIME AND	TOFAR POINTS TOO FAR APART TEMP KHEXT POINTS TOO CLOSE TOGETHEP OR EXACT YXX+2 YNEXT	HE GUTPUT FOINT 1 AND POINT 2 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
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				37555

IF POINTS EXACT CHANGE TIDICATORS	MOVE POINT 2 INTO POINT 1	ANY MORE POINTS? VES GET ANOTHER NO RESET THE ORIGIN FOR THE EXTERIAL CALLS TO CALIX AND CALIY RESET THE SCALE FOR THE EXTERNAL	THE SCALE FUN THE STO CALIN AND CALIN TO CALLING PROGRA	CALCULATE AN INTERNEDIATE POINT AND STORE IT :	OUTFUT POINT I AND THE INTERNEDIATE POINT	CHANGE INDICATORS MOVE INTERHEDIATE POINT INTO POINT 1 POINT 2 REMAINS THE SAME
TENP RSS CHANG	XX +2 XX +45 YY +42	NUM NEXT SETGR SETGR 4+3 XORG YORG SETSC	SEISC **3 XSCAL YSCAL PLINE, 1	TEHP XXX XX XX XX XX YX YY YY YY YY	77 77 77+2 77 77 70 100	CHANG XX+2 XX YY+2 YY
LDA TENI 92A,RSS JSB CHAI	010 010 010	182 JAP JSB DEF DEF			TAD FIX FLT USB UEF DEF	1SB 521 6LD 531 6LD 6ST 6ST 6ST
0100	0153	2	6136 6136 6136 6136 6146		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0173 0173 0175 0175

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9.6	CHANG	HOP		SUBPROCEAN TO CHANGE INDICATORS
86 88	•	LEA MOS	MOSED 1149	SWITCH THE MODE FROM WRITE TO ERASE OR "ICE-VERSA
Ø <b>Ø</b> €	į	1H4 S14	MODED	
92	•	LCA	<b>DORS</b>	SUITCH THE DASH OR SPHICE INDICATOR
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6610	•			
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12.05	CAL. IX	<b>€</b>		TO COMVERT
و		F.58	XORG	JORDINATE TO RASTER UNITS BY
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'n	4			
917	CALIY	401		TO CONVERT A Y
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8134		d H	YSCAL	(CY - YORG) + YSCAL
6519		FAD	PTS	FILE
0220		E i		BY ALL OTHER ROUTINES)
1221		<u>-</u> 1	21,40	
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#### 4.3 MAIN MODULE QUESTION FILES

This section contains the Listings of the Main Module Question Files. They are listed according to the sequence indicated in Section 4.0



1060	1234567890123456789012345678901234567890123456789012345678901234	78901234567890	11234
0002	**************************************	SION MODEL	:
0063	USE DEFAULT COMMON DATA FILE (DATABL) ?		£
700	Enter Number of Kuns and Common Data File (e.g. 04, DATAB2	.q. 04, DATA02)	_
5099	Keyboard Entry:		
9990	Kun Will Use Cata File		
2990	Run Type: RESEARCH-R OPERATIONAL	FRGCUCT 10H-P	
8900	nunch Time/Date?		3
6909	Enter Launch Time/Date:		
9100	Select Laurch Vehicle; DELTA*D TITAH=T	=T SHUTTLE=S	() # !!
1100			
5199	Enter Signs of Wind Azimuth Angle (xx,x);		
E109	**** PROCRAN REEDS HAS TERNINATED NORMALLY ****	*****	
£009	Desired Frocessing ? TERMINATE=T	KESTART=R	
5199	tions		
9199	H=ST	SOMETHING ELSE*SE	
2100	22.		HO-30
8199	Enter 221		
6199	Use Default Surface Reflection ? Rf=1.0	YES=25 M	MG=36
0050	Rf	- L	
1200	Use Default Height of Base Layer 7 25=0.0		110-36
0022	Enter 2b:		
0023	MET Plots?	YES	¥
0624	Generate The MET Plot Form?		2
6025	Generate Frinter Output?		웃
0026	Enter Specific Bounding: (1.e. 06, JAH, 5152)		
0027	Sounding #1:		
0028	Sounding 02:		
0029	Sounding #3:		
0030			
0031	Sounding #51		

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1 4

2RC1,D8 T=00003 18 OH CR00003 USING 60002 BLKS R=0000
0001 123456789012345678901234567890123456789012345678901234
0002 Estimated Top of Surface Layer(N) is:
0004 Enter Desired Top of Surface Layer(N):
0005 Calculated Top of Surface Transport Layer is:
0005 Use a Bigma for Wind Azimuth Angle of:
0006 Use a Bigma of Wind Azimuth Angle (xx.x):

C

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0001 123456789012345678901234567890123456789012345678901234 0002 Centerline Concentration Plot Desired ? YES HO 0003 Specific Site Fradictions (Plotted)? YES HO 0003 Specific Site Fradictions (Plotted)? YES HO 0004 Concentration Isoplath Plot Desired? YES HO 0006 Enter Range: Azimuth(deg): (0 Terminates Procedure) 0007 Enter Desired Complex: (Sea or Land Map) 0008 40,8=05 40,L=08 41,9=15 41,L=18
--

7KISOS T=00063 IS GH CRU0603 USING SQUAZ BRKS R=0000
12345678901644 Valuer: (Megative Value Terminates Procedure) 6006 Enter: Conc. )=
0007 Enter: Conc. )=
0008 40,9=03 40,L=08 41,9=15 41,L=20
17,8=03 17,L=08
0009 39,5=05 39,L=08

#### 4.4 EXAMPLE METEOROLOGICAL SOUNDING FILES

This section contains the current listings of two (2) example meteorological sounding files. They are listed according to the sequence indicated in Section 4.0.

9EC LEG 0000 007 007 104 007 201 007 201 007 300 001 340 001 109 5,0 H DEHSITY IR V/S
3 G/M3 H NTS
4 1273.00 377 678 6
3 1136.98 372 674 6
1 107.97 359 671 6
9 1078.02 323 670 6
1 1048.16 329 666 6
1 1017.62 296 666 6
0 9990.98 292 663 6
0 9935.27 261 659 6 DATAUL T-00003 15 CH CROO031 USING 60007 BLKS R-0000 20.23 20.23 10.96 13.09 11.38 11.38 11.78 11.78 11.78 ABHUM ₹ <u>5</u> 216 171 121 121 1027.00 1909.00 1999.00 19949.00 1999. 0670.82 0546.92 0393.99 PRESS 866.0 8753.5 9650.0 9600.0 9550.0 9566. 9456. 9400. - 22.22 - 22.23 - 22.23 - 24.39 - 24.39 12.1 -12.9 TEMP BICHIFICANT LEVELS = : ALT FT DIR KTS 011839 154 007 152 153 179 122 136 017247 025525 026796 119310 125487 122171 629 8827 8828 8829 8838 623 623 624 624 625 625 1600

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1000	TEST HBR	K O.	03718	O HINUS	9	Ī							
2999	KANTHSONDE RUN APZGK	HOH!	RUE	APIGE	<u></u>								
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1.000	06312	7 9 -	DEC	1974									
0 ខំ ប៉ីS	ASCENT	HBE	5	6529									
0000	ALT	C IR	SPD	TEMP	D, 7F.T	PRESS	X	HEHEM	DENSITY	<u> </u>	47.5	SHEAD	٩
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9000	<b>9</b> 000016	310	900	67.9		1023.00	699	5.64	1264.61	317	653	3	9
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0010	00200	355		7.70		1670.91	629	4.72	1176.88		6.53	906	087
1100	000000	9+B		67.3		0916.53	0 7 0	3.31	1134.21		653		259
1012	66480	332		67.1		1883.27	629	3,63	1636.63		652	9	277
E 1 0,0	603660	418				11.12	637	2.76	1058.64		651	D .	247
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0015	009200	319		03.6		1796.69	037	2,28	6933.15			=	679
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6621	MAINDATORY	784	LEVEL	S									
0022	ALT FT	DIR		TENP	D/PT	PRESS	ž						
0023		339				1000.	99¢						
0024		355		87.8	-0.5	1950.	124						
6625		340			-5.2	. 0960	:						
0026	005029	7				854.0	037						
1027	006655	318				8.008e	137						
0028	12800	297	035		٠	0750.¢	938						
6000	SIGNIFICANT	CAN		¥									
0036	ALT FT	SIR.	~		D/PT	PRESS	2						
1200	E+2000	7	919	69.5		996.	310						
2506		355			02.2	•	259						
6033	691299	354	020				284						
1034	906136	302	027				243						
0035	007343	310	030	63.0	•	<b>10000</b>	233						
9696													

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